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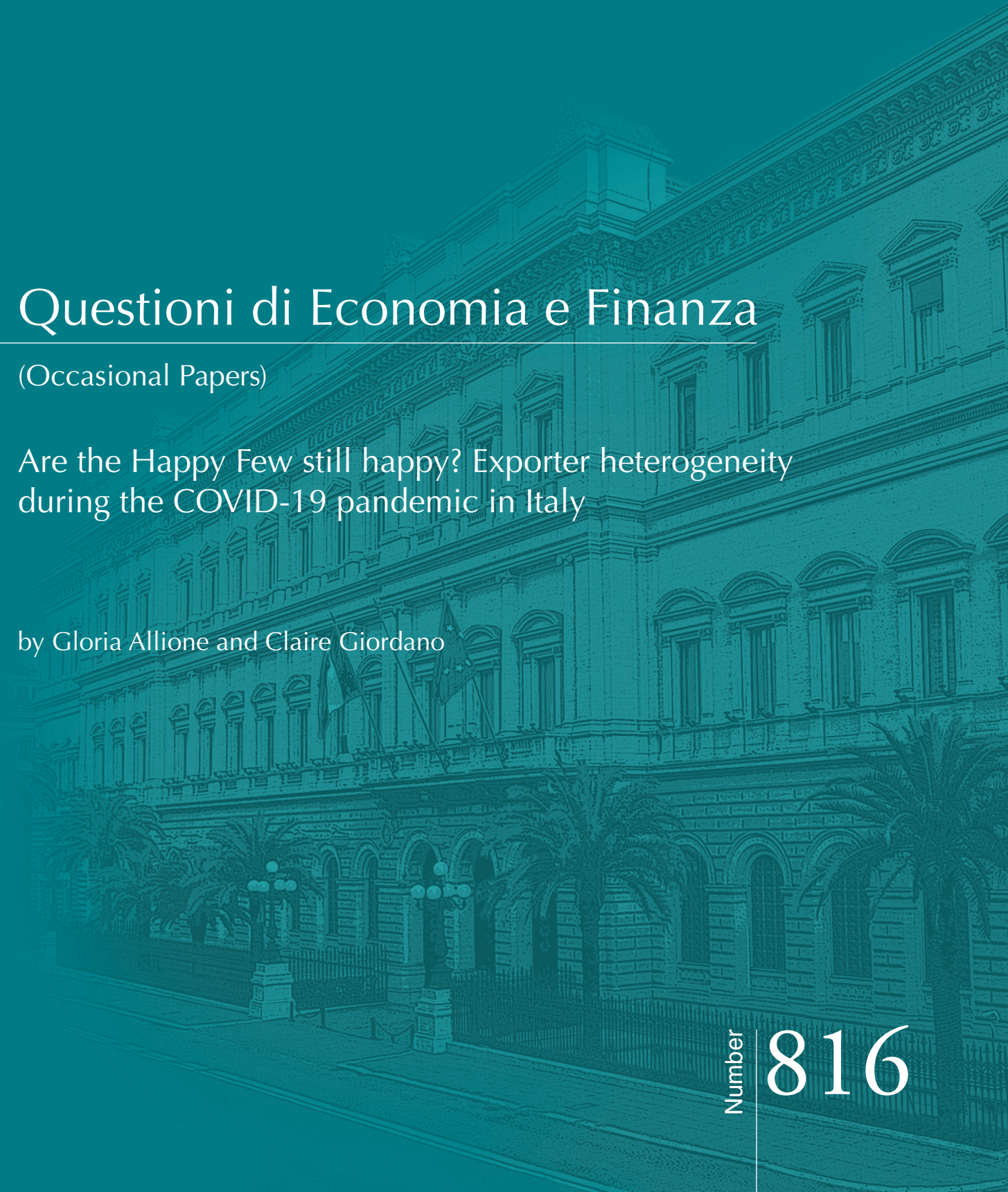

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ARE THE HAPPY FEW STILL HAPPY? EXPORTER HETEROGENEITY DURING THE COVID-19 PANDEMIC IN ITALY

by Gloria Allione* and Claire Giordano*

Abstract

By using highly granular monthly customs data and firm balance sheets, we document how firm heterogeneity mattered significantly in explaining Italy's 2020-21 goods export dynamics. Via a trade margin decomposition, we show how the exporters in the top 1 per cent of the export distribution (the 'Happy Few') were responsible for both the 2020 pandemic collapse and the slowdown in the second half of 2021 triggered by global input shortages. These firms operated mainly at the intensive margin and only partly by exiting some countries during the first wave of the pandemic. The relatively weaker performance of the Happy Few is confirmed when controlling for product and geographical specialization via econometric shift-share regressions. One possible explanation is the high share of top exporters participating in global value chains (GVCs). Exporters strongly integrated in GVCs were indeed hurt more by the two shocks than non-GVC firms were. Moreover, the exports of GVC firms that resorted more intensely to just-in-time business models with low inventory levels were more adversely affected by the 2021 supply chain disruptions.

JEL Classification: D22, F14.
Keywords: firm heterogeneity, global value chains, inventory management, trade margins, shift-share decomposition.
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Contents

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1 Introduction[1]

In 2020 the outbreak of the COVID-19 pandemic and the subsequent unprecedented lockdown measures introduced to prevent the spreading of contagion led to a sharp downturn in world trade. The contraction in the volume of merchandise flows was comparable to that observed during the Great Trade Collapse in 2008-2009, yet it was even more abrupt. Firms were indeed simultaneously affected both by a negative (foreign and domestic) demand shock, due to the stay-at-home measures world-wide and to the general economic downturn that curtailed expenditure, and by a negative (foreign and domestic) supply shock, due to factory closings at home and abroad and to disruptions in global value chains (GVCs). The recovery from the pandemic trade collapse was swifter than 15 years earlier, also due to a composition shift in demand from services to goods, given the persistence of social distancing rules. Yet world trade then slowed in the course of 2021 as a result of another negative supply shock: global input shortages and international logistics difficulties were triggered by further COVID-19 outbreaks and restrictive policies in several regions around the world, amid strong demand from the global recovery and attempts of firms involved in supply chains to build buffers in already lean production networks (Celasun et al., 2022). In these two years Italy's goods exports mirrored world trade developments.

By exploiting highly granular customs data (available at the time of writing of this paper until 2021), our contribution to the trade and COVID-19 literature is to analyze the heterogeneity in the transmission of the 2020 pandemic shock and the 2021 supply bottleneck shock across Italian firms of varying export size and adopting different risk management strategies (namely, participation in GVCs and just-in-time inventory practices). The timing of the COVID-19 pandemic and of the subsequent global input shortages imposes the use of high-frequency data and our monthly customs dataset is thus very well suited for studying the micro determinants of the aggregate trends. Our work is thus related to firm-level studies examining the granular sources of international trade adjustment during unprecedented external shocks (e.g. Bricongne et al., 2012; Behrens et al., 2013; Amador and Opromolla, 2017; Martin et al., 2021; Amador et al., 2021; Bricongne et al., 2022; Berthou and Stumpner, 2022 Brussevich et al., 2022). To the best of our knowledge, this is the first paper to address these issues for Italy throughout and after the 2020 trade contraction, using highly detailed and exhaustive information on individual firms' exports.

A priori it is not obvious which export size class should fare better under shocks (see, for example, Amador et al., 2021, Bricongne et al., 2022 and Brussevich et al., 2022). Indeed, on the one hand, larger exporters tend to have a wider and more diversified portfolio of products and destinations that allows cushioning the losses in specific sectors or countries. On the other hand, smaller exporters that generally do not have a global and continued presence on export markets are less damaged by internationally synchronized shocks or by the reduced possibility of exploiting economies of scale. Moreover, dealing with more limited shipments, smaller exporters may be more nimble in, for example, overcoming transport disruptions.

Similarly, GVC participation – entailing the purchase of inputs from abroad for use in export production or the export of inputs for employment by a trading partner - *a priori* may be either a channel of amplification or of mitigation of shocks (see, for example, Bonadio et al., 2021; Espitia et al., 2021; Baldwin and Freeman, 2022; Giglioli et al., 2021). On the one hand, when a supply shock hits countries that are a source of inputs for exporters, the firms that are more reliant on input imports are more adversely affected. Similarly, when a shock disrupts production in a destination country, firms that export intermediates to this country are hurt

[1]We thank Silvia Fabiani, Stefano Federico and Alberto Felettigh for useful comments on previous drafts of the paper. The views expressed are our own and are not necessarily shared by our institution.

more. These upstream and downstream disruptions therefore magnify shock transmission. On the other hand, the negative impact of domestic factory closures could be attenuated by a firm's higher dependence on imported inputs in export production, mitigating shock transmission. The degree of participation in GVCs is generally not independent from export size: large firms are indeed more likely to be more engaged in GVCs (Antràs, 2021) and are hence more likely to be exposed to these dynamics.

Finally, since the recent literature has also pointed out how different inventory management strategies can affect a firm's exposure to external supply shocks (e.g. Lafrogne-Joussier et al., 2023), we also analyse the export performance of GVC-participating enterprises in relation to their degree of reliance on just-in-time (JIT) business models. Inventories may insure against input shortages since firms with more stocks can keep on serving their downstream partners even when facing shortages in the supply of materials and intermediate goods necessary for production. By contrast, exporters that tend to maintain low input inventories strongly rely on transportation, logistics and foreign suppliers for JIT deliveries and may hence be particularly vulnerable to supply chain disruptions.

The quest to better gauge how these dimensions of firm heterogeneity shaped aggregate outcomes in Italy in 2020-21 can only be settled empirically. Following Bricongne et al. (2012), the decomposition between different types of firms' margins is central to our understanding of the main channels through which overall exports move in response to macroeconomic shocks, in that it allows assessing what part of the recent evolution of trade arose from changes in the volumes of shipments (intensive margin) and what part from the contribution of firm-product-destination-specific dynamics of entry and exit (extensive margin). We track in particular the foreign sales of the "Happy Few" (term coined to our knowledge by Mayer and Ottaviano, 2011), i.e. the top 1 per cent exporters of the export distribution, which account for the bulk of aggregate exports, and their role in explaining the COVID-19-related export collapse and then the following slowdown. Since the Happy Few are also frequently integrated in GVCs, by combining customs data with firms' (annual) balance sheets, we also investigate the contributions to export dynamics of heterogeneous firms according to their engagement in international production processes, measured by the extent of their two-way trade (World Bank, 2020). We further distinguish between GVC-integrated exporters according to a proxy of their degree of recourse to JIT inventory practices (Giglioli and Romanini, 2023).

We are however aware that the different firms' export outcomes may depend on the performance of the sectors they operate in or of the destination markets they serve. For this reason, by adopting an econometric shift-share approach in the vein of Cheptea et al. (2005), Bricongne et al. (2012) and Gaulier et al. (2013), we also investigate whether product and geographical specialization were important determinants of trade patterns during the two shock episodes and appraise the different types of exporters' performance stripped of their product and destination orientations.

Our main findings confirm that aggregate fluctuations arise from microeconomic sources and in particular that export size ultimately did matter in the recent trade crisis. Indeed, this paper provides evidence that the Happy Few, in which a large share of Italian exports are concentrated, played a dominant role during the COVID-induced drop in aggregate goods exports and the subsequent slowdown, in particular via their intensive margin. The top exporters were more adversely affected by the two shocks than smaller firms, even when product and geographical specialisations are controlled for. One possible explanation, corroborated by our results, is the former's more widespread integration in GVCs relative to smaller enterprises, which magnified the negative demand and supply shocks. Furthermore, amongst GVC-participating firms, resorting to JIT production strategies was linked to a sharper export slowdown in the second half of 2021, implying a larger vulnearbility of these exporters to supply chain disruptions.

The remainder of the paper is organized as follows. Section 2 briefly describes the related international trade literature. Section 3 refers to the data sources underlying our study. Section 4 presents some descriptives and discusses how we define the different firm categories analysed in this paper. Section 5 decomposes goods exports variation into the various margin adjustments and looks into the contributions of heterogeneous firm types. Section 6 runs a shift-share regression in order to disentangle the role of products, destination markets and firm heterogeneity in determining aggregate export dynamics. Section 7 concludes.

2 Related literature

This paper relates to several literatures. In general, our paper contributes to the research assessing the micro determinants of aggregate developments and the role of large exporters in international trade, spearheaded by Gabaix (2011). Mayer and Ottaviano (2011) establish a set of regularities for European firms and find that the export distribution is highly skewed. Freund and Pierola (2023) document that exports are indeed very concentrated in a number of countries and are shaped by a handful of "superstar exporters" that can transform sectoral patterns and alter comparative advantage. Giordano and Lopez-Garcia (2021) find similar, more updated evidence for European economies, on the basis of micro-founded cross-country comparable data. Bernard et al. (2018) show how few "global firms" participate in the international economy along multiple margins and account for substantial shares of aggregate trade.

More specifically, our work is related to firm-level studies examining how international trade adjusted during exceptional external shocks, namely the Great Trade Collapse or the COVID-19 pandemic. These analyses have thus far been conducted, for example, for France (Bricongne et al., 2012; Di Giovanni et al., 2014; Bricongne et al., 2022; Martin et al., 2021; Berthou and Stumpner, 2022 Brussevich et al., 2022), Belgium (Behrens et al., 2013) and Portugal (Amador and Opromolla, 2017;Amador et al., 2021), but not for Italy, given the unavailability of detailed high-frequency customs data until recently. Our analysis hence enhances the possibility of comparing firm-level findings across selected countries specifically during the pandemic shock, as well as complementing studies focusing on Italy that have been thus far conducted at the macro-sectoral level (e.g. Federico and Giordano, 2021; Allione and Felettigh, 2021; Istat, 2021).[2] Relative to the papers examining the 2020 trade collapse, however, we investigate not only the initial downturn and the immediate recovery, but also the subsequent slowdown due to global supply disruptions in the course of 2021.

We also contribute to the broad literature on GVCs and their role in the transmission of shocks. Bonadio et al. (2021) examine the international transmission of the COVID-19 pandemic using a multi-sector model with input-output linkages. By simulating a global lockdown as a contraction in labour supply, the authors estimate that although one-quarter of GDP declines is attributed to the GVC-related shock transmission, severing GVCs would not make countries more resilient since the renationalization of production would concentrate risk in the domestic economy. On a similar note, Eppinger et al. (2021) find that, after decoupling, the effects of foreign supply shocks are mitigated on average, but some countries experience magnified effects; furthermore, welfare losses from decoupling far exceed any benefits from lower shock exposure. Espitia et al. (2021) assess the impact of the 2020 shock on international trade flows of a large country panel. Wide sector heterogeneity is documented; in particular, GVC engagement increased a sector's vulnerability to shocks suffered by trading partners, although it also reduced exposure to domestic shocks. Berthou and Stumpner (2022) find a decline in

[2] At the same time of publication of this paper, a complementary study (Cariola, 2023) on the same Italian data was released, assessing both exports and imports and their relation to the stringency of COVID-19 restrictions.

trade due to forward linkage effects, i.e. a decline in intermediate goods exports that depend on final demand in a third country entering a lockdown, and to backward linkages, i.e. supply disruptions of imported inputs that are used for the production of exported goods. Whereas this literature mostly focuses on the structure and geography of GVCs, we instead exploit the monthly frequency of firm-level trade data to study the implications of GVC integration for firms' exposure and adjustment to external shocks. More similar to our paper are therefore Amador et al. (2021), which, using firm-level customs data for Portugal, find that the detrimental impact of the 2020 lockdowns on exports is higher for firms that are integrated in GVCs, Lebastard et al. (2023), which document how participation in GVCs increased French firms' vulnerability to the COVID-19 shock in terms of both export performance and probability of survival in the export market, and Bricongne et al. (2022), which instead do not find a significant impact of GVC engagement of French firms in the context of the 2020 trade collapse.

Another related strand of the literature to which we contribute has focused on the role of inventories in buffering firms against supply chain disruptions. Lafrogne-Joussier et al. (2023) estimate that French firms that sourced intermediate goods from China before the latter country's early lockdown experienced a larger drop in imports and exports than comparable firms not sourcing from China. Amongst the exposed firms, whereas the ex-ante geographic diversification of inputs did not mitigate the impact of the shock, firms with relatively high inventories were able to absorb the supply shock better. Relative to this literature, we investigate whether indeed firms involved in GVCs, and amongst them those that adopted JIT production strategies, were more exposed to the foreign shocks triggered by the first wave of the pandemic in 2020 and again by global supply shortages in 2021 and how they contributed to shape aggregate outcomes.

Finally, from a methodological standpoint, our study contributes to the firm-level literature that empirically characterizes the margins of international trade adjustment (e.g. Bernard et al., 2007, Gopinath and Neiman, 2014,Bugamelli et al. (2019) and Bricongne et al., 2022). It also relates to the econometric shift-share regressions put forward in Cheptea et al. (2005), Bricongne et al. (2012) and Gaulier et al. (2013). Relative to standard algebraic shift-share decompositions, this approach has the advantage of producing results that do not depend on the ordering of product and geographical specialization and that may be assessed within statistical confidence intervals. To our knowledge, this type of shift-share breakdown has never before been conducted on Italian firm-level data.

3 The data

Our analysis builds on monthly customs (*Agenzia delle Dogane e dei Monopoli*) data that cover Italian goods exporters for the period 2019–2021. Details on these data and on the cleansing procedures undertaken are provided in Annex A. The data include detailed information on individual firms' export values at current euros classified at the eight-digit level of the European Combined Nomenclature (CN), where the first six digits correspond to the Harmonized System (HS) code, and at the destination country level. Our lowest level of export aggregation is thus the four-dimensional firm-by-product-by-destination-by month level. When employing monthly data, seasonality and the number of working days are potentially an issue. We tackle this by focusing on changes relative to the corresponding month of the previous year.

For the purpose of our analysis and in line with official Istat (Italy's national statistical institute) International Merchandise Trade Statistics (IMTS), we exclude trade in monetary gold, military equipment and works of art. Moreover, we discard: a) individuals and micro-firms that only report quarterly data and for which generally no product detail is available; b) natural gas and electricity for which Istat uses alternative sources to track trade flows; c)

exports to entities that are not referred to a specific jurisdiction, such as unspecified countries and territories; and d) the so-called *voci della nomenclatura combinata (CN8) soggette a vincolo di riservatezza*, i.e. those products that for confidentiality reasons in some years are not reported at the 8-digit product level by Istat. The latter four exclusions, aimed at excluding incomplete or noisy trade flows, lead to marginal discrepancies relative to official IMTS.

In order to delve deeper into firm characteristics, we combine these customs data with firm balance-sheet data (*Cerved*), available at annual frequency, in turn referring to incorporated firms in Italy, from which, for example, total sales revenues, total purchase expenditure and the level of inventories may be drawn.

In our analysis we consider both manufacturing and services firms exporting goods, in that the latter for instance include non-negligible retail and wholesale traders of "made in Italy" products. Moreover, the share of goods exports by service firms, although naturally much smaller than that of manufacturing enterprises, has been gradually increasing over time.[3]

On average across the years available the value of total exports in our dataset represents 98 per cent of the corresponding total value of exports published in official statistics, as shown in detail in Annex A. Our further polished customs dataset[4] tracks Istat's IMTS y-o-y export dynamics very well at a monthly frequency (Figure 1).[5] Italy's goods exports are confirmed to go through three different phases in the period under study: the first COVID-19 outbreak, which led to strict lockdowns in Italy and in its main trading partners, and to the sharp export collapse between March and August 2020; the subsequent recovery, which was particularly pronounced also owing to an abrupt shift of household spending towards goods, in turn due to a repression in expenditure in contact-intensive services and to a higher demand for certain products linked to work-at-home and social distancing behaviour; the slowdown in world trade in the second half of 2021, triggered by global shortages in materials, intermediate inputs and labour, as well as jammed logistical networks, in turn linked to further COVID-19 outbreaks and containment measures in various parts of the world.[6]

Our polished dataset includes around 124,000 firms in 2019 (Table 1) – an only marginally higher figure to that sourced from the Italian Trade Agency (ICE) and Istat on exporting firms (Istat-Ice, 2023) – and about 9,300 NC8 products, exported to 235 destinations, representing 98.5 per cent of the corresponding Istat IMTS export value. The subsample of firms matched with the Cerved database employed to delve into some dimensions of firm heterogeneity covers approximately 96,000 exporters in 2019 (Table A2 in Annex A) and 85 per cent of the IMTS export value.

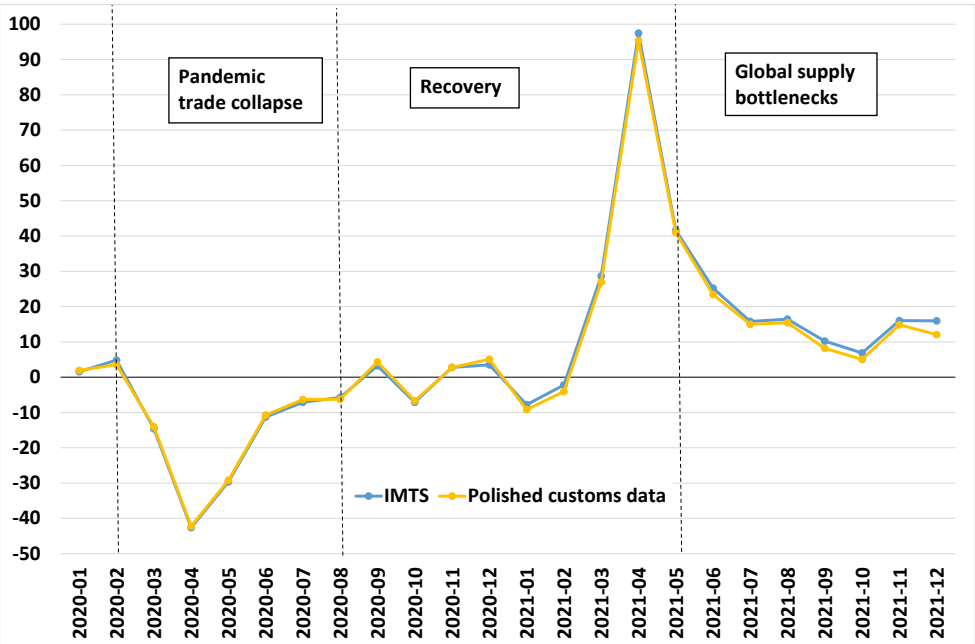
[3]Specifically, in our combined customs-Cerved dataset in 2019 about 14 per cent of total goods exports were accounted for by non-manufacturing sectors (Table A2 in Annex A). This figure is only slightly smaller to that derived from Istat-Ice (2023).

[4]As discussed in Annex A, further cleaning procedures include only keeping firms that exported goods for a value of at least EUR 10.000 in at least one of the years under study, in order to remove any remaining noisy observations.

[5]Although both series are in value terms, the IMTS data dynamics are very similar in most of the period under study to export volume dynamics, obtained by deflating Istat values with producer prices of goods sold in export markets (Figure A1 in Annex A). The only exception is the second semester of 2021 when export volumes grew less than corresponding values, owing to export prices starting to rise. The analysis of export prices and quantities goes however beyond the scope of this paper.

[6]We date the "global supply bottlenecks" period as of June 2021, based both on the developments in the Global Supply Chain Pressure Index (New York Federal Reserve Board, 2023) and on the actual slowdown in Italy's goods exports.

Figure 1: **Goods export dynamics**
(y-o-y percentage changes; current prices)



Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data and Istat IMTS.

Table 1: **The number of exporters and total export values by year**
(percentage shares)

Year	No. of exporting firms	Total export value (EUR bln)
2019	124,184	458.7
2020	115,936	420.0
2021	117,147	491.2

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: Total export values are marginally lower than those in Table A1, because data were further cleaned after the comparison with official Istat IMTS, as discussed in Annex A.

4 Some descriptive evidence on exporting firms in Italy

We first look into some stylised traits of Italian goods exporters prior to the outbreak of the pandemic. As in Bernard et al. (2007) and Bernard et al. (2018) for the US and Bugamelli et al. (2019) for Italy prior to 2015, we document the importance of multi-product exporters and of multiple destinations in overall goods exports. Tables 2 and 3 indeed report joint distributions for exporting firms across the number of products exported (rows) and the number of destinations served (columns), as regards the percentage of exporting firms and the percentage of export value, respectively. The cells in each table sum to 100. In 2019 one fourth of exporting firms sold a single NC8 product abroad, representing however a mere 2 per cent of export value. Conversely, exporters of five or more goods accounted for over 40 per cent of firms and 90 per cent of export value. One third of exporting firms shipped their goods to a single destination country, though these exports represented only 2 per cent of aggregate exports. By contrast, firms exporting to five or more destinations accounted for 40 per cent of exporters, and 93 per

cent of export value.[7] Across the two tables, the last diagonal term is large, so that firms that export to many destinations also, on average, export many products. These results suggest that also in Italy a small share of firms dominate exports and that they are large in size, in part because they ship many products to many destinations. They also suggest that there is scope for firms to adjust on the extensive margin, as well as on the intensive margin.

Table 2: **The number of exporters by number of products and destination markets** *(percentage shares)*

Number of products	Number of countries					
	1	2	3	4	5+	**Total**
1	18.8	2.4	1.0	0.6	1.6	**24.4**
2	6.1	4.4	1.4	0.8	2.3	**14.9**
3	2.9	2.3	1.6	0.8	2.7	**10.2**
4	1.5	1.3	1.1	0.8	2.8	**7.5**
5+	3.7	3.0	2.8	2.6	30.8	**42.9**
Total	**33.0**	**13.4**	**7.9**	**5.6**	**40.2**	**100.0**

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.

Table 3: **The value of exports by number of products and destination markets** *(percentage shares)*

Number of products	Number of countries					
	1	2	3	4	5+	**Total**
1	0.7	0.3	0.2	0.1	0.8	**2.1**
2	0.8	0.3	0.2	0.1	1.5	**2.9**
3	0.1	0.4	0.1	0.1	2.1	**2.9**
4	0.1	0.1	0.1	0.1	1.8	**2.3**
5+	0.6	0.6	0.8	0.9	87.0	**89.8**
Total	**2.3**	**1.7**	**1.4**	**1.4**	**93.2**	**100.0**

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.

In the vein of Bricongne et al. (2022), we next investigate the pre-pandemic export size distribution across firms, by defining four bins (0–80; 80–95; 95–99; 99–100) according to the percentiles of firms' total yearly goods export sales in 2019.[8] In this year over half of total goods exports was accounted for by the top 1 per cent exporters (about 1,240 firms), whereas only 5 per cent of exports were sold by firms in the 0-80 export size class (Fig. 2a). Even among the largest exporters, the top 1 per cent stand out. Average exports of the top exporters are approximately 100 times higher than those of the firms in the 0-80 export size class, but they are also five and half times higher than those in the 99-95 percentile (Table B1 in Annex B). This disproportionately high concentration of export sales in few firms in the right-hand side tail of the export distribution is a known stylised fact in the trade literature, common to a diverse range

[7]Note that by excluding firms that export less than EUR 10.000 from our analysis, we are mainly dropping single-product and single-destination exporters. The actual number of the latter exporters is hence higher than that here reported, but the corresponding export value shares are confirmed at 2 per cent. Indeed, for the universe of firms over the period 2000-15 Bugamelli et al. (2019) report that about one third of exporters shipped only one product (defined, however, at the HS6 level), but they accounted for only 2 per cent of aggregate goods export value.

[8]When the firm is missing for that year, we classify the size of a firm according to 2018, 2020 or 2021 data. The first bin includes firms under the 1.4 EUR mln export threshold, the second bin under 10.9 EUR mln, the third under 55.7 EUR mln, the fourth above this threshold.

of countries (e.g. Freund and Pierola, 2023; Bernard et al., 2018; Giordano and Lopez-Garcia, 2021), such that to refer to these firms Mayer and Ottaviano (2011) coined the term "Happy Few" , which we adopt in this paper. Unsurprisingly, nearly all top exporters (i.e. 95 per cent of this one per-cent category) sell more than five products to more than five destinations.[9] In 2019 the Happy Few's main destination markets (Table B2 in Annex B) were mostly advanced economies, namely the other five largest euro-area countries, the UK, Switzerland and the US, or countries with which Italian firms are either regionally or globally integrated in production chains, such as Poland and China (Fabiani et al., 2019). These firms mainly shipped goods such as machinery, motor vehicles, pharmaceuticals, electrical equipment, mineral fuels and oils, precious stones, iron and steel and articles thereof, plastics and wearing apparel (Table B3), which are among those products whose world trade in value terms increased significantly over the 2010-19 decade. The strong dynamism of the top exporters is also confirmed when examining the export time series by fixed export size class sourced from ICE and Istat (Istat-Ice, 2023): over the 2010-19 period, the average annual growth rate of exports exceeded 7 per cent for firms with annual exports worth over 50 EUR mln (broadly overlapping with the Happy Few in this paper), which is more than 6 percentage points higher than the corresponding rate for the smallest exporters (i.e. with annual exports worth less than 750,000 EUR, which roughly coincide with the 0-80 bin herein).

Large firms are more likely to be more engaged in global value chains (Antràs, 2021). To test for this feature in our dataset we need to construct a proxy variable to measure GVC participation, in the absence of firm-level input-output matrices. Following World Bank (2020), which considers that a firm is engaged in GVCs if it both imports some of its inputs and exports part of its output, we define as "GVC firms" those enterprises that contemporaneously sourced at least 5 per cent of their total goods purchases from abroad and gained at least 5 per cent of their foreign revenue from abroad in 2019, where purchases and turnover are drawn from Cerved.[10] Within this category we distinguish between "moderate" and "intensive" GVC firms, with the latter importing more than 40 per cent of their purchases and exporting more than 50 per cent of their turnover.[11] Firms for which balance sheets or the necessary balance sheet information are not available fall into a residual category of unclassified firms.

One fifth of the firms in our sample (around 24,000) are GVC firms, of which over 3,000 are "intensive" (again see Table B1). GVC enterprises account for about two-thirds of total goods export values (Fig. 2b)[12] and are generally multi-product multi-destination exporters. In 2019 intensive GVC firms' average exports were double those of moderate GVC enterprises, which in turn were double those of firms not integrated in GVCs. The share of GVC firms grows monotonically with export size: over three quarters of the Happy Few are engaged in GVCs (Table 4), against only about one tenth of the smallest exporters, under half of the medium exporters and over two thirds of large exporters.[13] Over one fourth of the Happy Few are intensive GVC firms, against under 1 per cent for the smallest exporters. The geographical export exposure of the intensive GVC Happy Few is not significantly different to that previously

[9] This share is only one fourth for the smallest exporters.

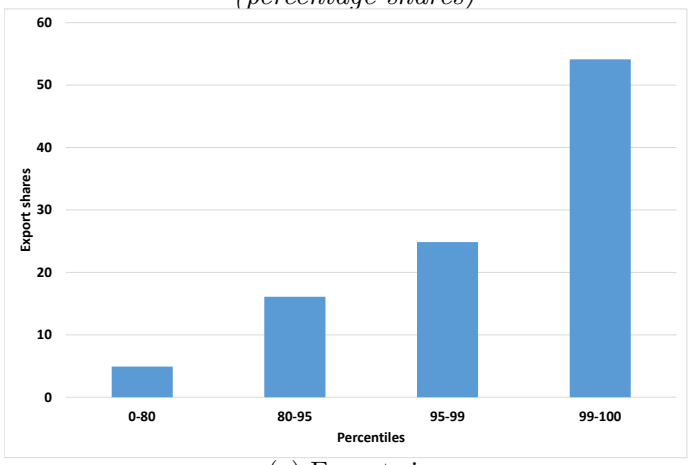
[10] When the necessary data are unavailable in 2019, we consider as GVC firms those enterprises that satisfied these conditions in 2018, 2020 or 2021. Amador et al. (2021) proxy GVC engagement with foreign capital participation. This information is not available in our dataset and would require matching our data with the relevant information in, for instance, Orbis Historical Database; we leave this avenue for future research.

[11] These thresholds correspond to the 75th percentile of the distribution of the two variables.

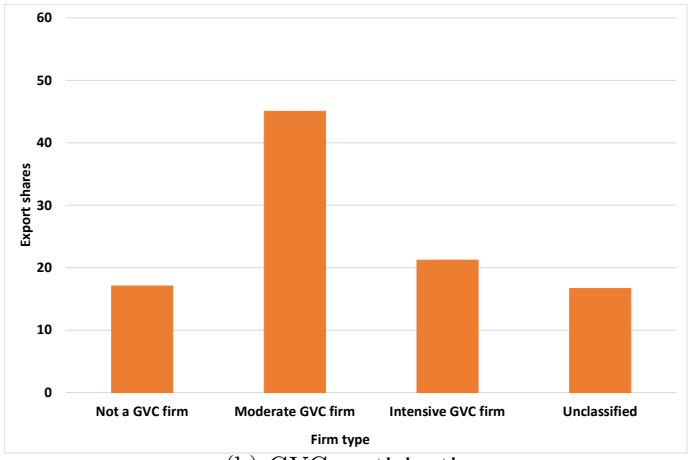
[12] Their weight reaches three fourths if only manufacturing firms are considered.

[13] The unclassified firms largely fall in the 0-80 export size category, in that smaller firms are exempt from mandatory balance sheet reporting. Whereas there is a stark difference between the degree of involvement in GVCs of top exporters relative to small and medium exporters, the intensity of exposure to imports specifically from China is not significantly different: in 2019 under one fourth of the Happy Few imported a significant amount of goods from this country against a share of nearly one fifth amongst small and medium exporters.

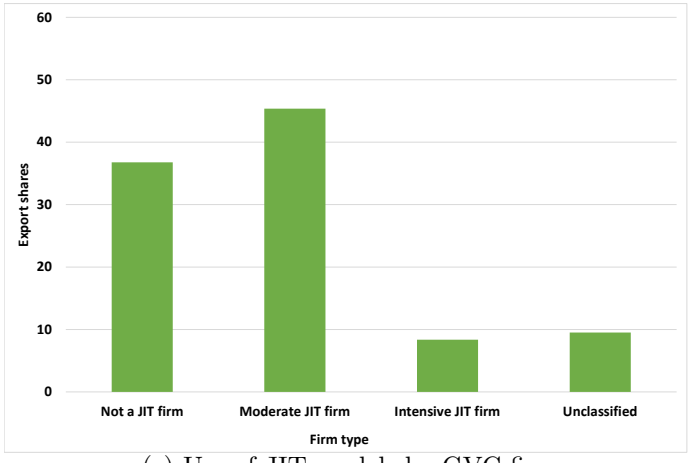
Figure 2: **Export shares by firm type**
(percentage shares)



(a) Export size



(b) GVC participation



(c) Use of JIT models by GVC firms

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs and Cerved data.
Notes: Firm categories are described in the main text.

reported for all top exporters[14], whereas there are some differences as regards products sold, with higher export shares of electrical equipment and of the materials reported in Table B3, such as fuels and iron and steel, as well as of chemicals.

Table 4: **The share of exporters by firm type**
(percentage shares)

	GVC firm:			
	No	**Moderate**	**Intensive**	**Unclassified**
Export size:				
0-80	25.3	10.2	0.7	63.8
90-95	33.5	39.7	7.2	19.6
95-99	20.1	52.5	19.4	8.0
99-100	11.0	50.0	27.5	11.4

	JIT firm:			
	No	**Moderate**	**Intensive**	**Unclassified**
GVC firm:				
No	21.4	23.0	10.9	44.7
Moderate	30.9	28.5	8.9	31.7
Intensive	36.2	32.6	7.1	24.2
Unclassified	7.1	7.1	4.5	81.3

	JIT GVC firm:			
	No JIT	**Moderate JIT**	**Intensive JIT**	**Unclassified**
Export size:				
0-80	24.6	20.6	9.1	45.7
90-95	35.1	32.0	8.6	24.3
95-99	42.4	40.5	6.2	10.9
99-100	43.5	45.8	5.7	5.0

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs and Cerved data.
Notes: Firm types are described in the main text. The reference year is 2019. Export size is computed on the export distribution of all firms, in both the upper and lower panels of the table.

We finally classify GVC enterprises in accordance to their inventory management, relying on the measure put forward by Lafrogne-Joussier et al. (2023) and Giglioli and Romanini (2023). The level of end-of-the-year inventories is recovered from Cerved balance-sheet data in 2018 and 2019[15], divided by the firm's yearly turnover and multiplied by 365. The ratio can be interpreted as the average daily production held in inventories. On the basis of Demeter and Matyusz (2011), according to which lean production practices are associated to a higher inventory turnover, a larger value of this measure indicates that a firm is adopting a more traditional business model relative to a JIT one. The days of inventory are then standardised for each 2-digit sector between 0 and 1 to account for systematic differences in the level of stocks across sectors with heterogeneous technology and production processes, and are averaged across the two years 2018–19. We here restrict the analysis only to manufacturing firms, for which inventory data

[14]The only exception is a larger share of foreign sales directed to Switzerland.

[15]It is not mandatory for all firms to report input and output inventories separately and hence we exploit the aggregate value, as done in Lafrogne-Joussier et al. (2023). Moreover, taking a two-year average helps reduce the possible bias linked to the fact that end-of-year inventories may not be representative of inventories during the rest of the year.

are more reliable.[16] The resulting JIT measure for each firm f is:

$$\text{JIT}_f = \frac{1}{T}\sum_{t=1}^{T}\left[1 - \left(\frac{dd_{tf} - \min\{dd_{ts}\}}{\max\{dd_{ts}\} - \min\{dd_{ts}\}}\right)\right] \in [0,1] \quad (1)$$

where $T = 2$ refers to the years 2018 and 2019, s indicates the sector and dd are the days of inventory.[17] A higher value for JIT_f means that, compared to other firms in the same sector, firm f keeps inventories in stock for a lower number of days, therefore tends to use a business model that is more similar to a JIT model. We categorise GVC firms into the following groupings: "not JIT" firms, when JIT_f falls below the 40 percentile of the distribution of this measure, "moderate JIT" firms, when it falls in the 40–80 percentile class, and "intensive JIT" firms when it exceeds the 80th percentile. We again define an unclassified category of firms for which inventory data are not available or which are active in non-manufacturing sectors.

Over one third of GVC firms resort to JIT deliveries (Table B1) and account for above half of GVC firms' total goods export values (Fig. 2c). Intensive JIT firms are slightly smaller exporters than both their moderate counterparts and not JIT firms (Table B1). Chemical products, beverages, furniture and footwear are amongst intensive JIT firms' highest value exports. Over half of the Happy Few involved in GVCs adopt JIT models (Table 4).

After having described the main traits of several categories of exporters in 2019, in the next sections we move on to assess the drivers of aggregate export dynamics in 2020-21 and the contributions of heterogeneous firms.

5 Export margins and heterogeneous firms

5.1 The export margin decomposition

By exploiting the granularity of our data, actual aggregate goods export dynamics can be broken down into different trade margin adjustments, similarly to studies such as Bricongne et al. (2012) and Bugamelli et al. (2019). The decomposition we adopt reflects the contribution of three distinct firm decisions: the decision to enter/stay/exit foreign markets, the decision of what products to export abroad and the decision of where to export these products.

More formally, each of our elementary firm-product-destination export flows can be classified into four types: created (positive extensive margin); destroyed (negative extensive margin); increased (positive intensive margin); and decreased (negative intensive margin). Their sum yields the aggregate export flows. The difference between increased and decreased flows is the firm-product-destination intensive margin, whereas the difference between created and destroyed flows is the corresponding extensive margin. The firm-product-destination intensive margin hence refers to the export value associated with continuing trade relations, i.e. exports of all the product-destination pairs (kj) sold by the same firm f in months t and $t-12$. The firm-product-destination extensive margin instead captures the contribution of new and abandoned transactions within firms, where a new (destroyed) flow may arise in one of the three following cases: (a) a new (an exiting) exporting firm (firm extensive margin); (b) an additional (dropped) product by an incumbent exporter (product extensive margin); (c) a new (an abandoned) destination served by a continuing exporter of an already established product (destination extensive margin). The overall firm-product-destination extensive margin is the sum of these three dimensions.

[16] Moreover, this choice allows discarding exporters in the distribution sector, which notably have much greater inventory capacity than manufacturing firms.

[17] This proxy is hence the same as that in Giglioli and Romanini (2023), but based on the years 2018–19, instead of 2015–19, in order to be more consistent with the export size and GVC measures employed in our study.

In mathematical terms, y-o-y aggregate goods export developments, denoted by X, can thus be decomposed in the following manner, as in Bricongne et al. (2022):

$$\frac{\Delta X_t}{X_{t-12}} = \underbrace{\frac{\Sigma_{f\in C_t}\Sigma_{k\in C_{f,t}}\Sigma_{j\in C_{fk,t}}\Delta x_{fkj,t}}{X_{t-12}}}_{\text{Firm-product-destination intensive margin}} + \underbrace{\frac{\Sigma_{f\in EN_t}x_{f,t} - \Sigma_{f\in EX_t}x_{f,t-12}}{X_{t-12}}}_{\text{Firm extensive margin}} +$$
$$+ \underbrace{\frac{\Sigma_{f\in C_t}(\Sigma_{k\in EN_{f,t}}x_{fk,t} - \Sigma_{k\in EX_{f,t}}x_{fk,t-12})}{X_{t-12}}}_{\text{Product extensive margin}} + \underbrace{\frac{\Sigma_{f\in C_t}\Sigma_{k\in C_t}(\Sigma_{j\in EN_{fk,t}}x_{fkj,t} - \Sigma_{j\in EX_{fk,t}}x_{fkj,t-12})}{X_{t-12}}}_{\text{Destination extensive margin}} \tag{2}$$

where C refers to the set of continuing exporters, EN to entrants and EX to exiters. So, for example, $f \in C_t$ refers to the set of incumbent exporters, $k \in C_{f,t}$ refers to the set of products of incumbent exporters and $j \in C_{fk,t}$ refers to the set of destinations of incumbent products of incumbent exporters.

A caveat to our export margin decomposition is that we do not have information on the number of importers in each destination country; dropping or adding a buyer would always contribute to the extensive margin. This information is only available for exports to non-EU destinations and due to its patchy nature we have not employed it in this paper. Another limitation to the analysis is the presence of an export reporting threshold, discussed in Annex A, which implies that we may overestimate the number of firms ceasing to export, simply because their foreign sales drop below the threshold. These two caveats are anyhow common to all the other trade margin decompositions cited herein.

5.2 Results

During the 2020 trade collapse the firm-product-destination intensive margin and the firm-product-destination extensive margin (which we will refer to as intensive and extensive margins as shorthand) were broadly balanced in contributing to the huge slump in Italy's goods exports (Fig. 3a). Although this firm-level evidence is consistent with the macro findings in Istat (2021) for Italy in 2020, it is quite exceptional from a historical standpoint and in an international comparison. Indeed, the recent literature has pointed out how the existence of search and customizing costs to establish new trade relationships leads to sticky firm-to-firm relationships, especially in circumstances in which the imperfect enforceability of international contracting encourages firms to invest in intangible capital such as reputational capital (Martin et al., 2021 and Antràs, 2021). In other terms, for already active firms, entering and exiting trade relationships are more costly than changing the scale of sales, such that enterprises confronted by an exogenous shock generally prefer adjustments at the intensive margin to a reorganizing or downsizing of their transactions, in line with what was documented by Bernard et al. (2009) as regards the 1997 Asian financial crisis or Behrens et al. (2013) and Amador and Opromolla (2017) on the impact of the Great Trade Collapse in Belgium and Portugal, respectively. Moreover, Istat (2021) reports a smaller role of the extensive relative to the intensive margin in France and, especially, Germany in 2020[18]; for France this result is corroborated by micro-findings in Bricongne et al. (2022) and Brussevich et al. (2022). This suggests Italy was rather an outlier in this respect and a more detailed decomposition of the extensive margin can help shed light into this feature.

Indeed, further breaking down Italy's strong negative extensive margin during the first wave of the pandemic into its three components, we document that net negative entry in destinations

[18] In particular, Istat (2021) estimates that the extensive margin explained only one third of the drop in France's exports and one fifth in Germany, against about half in Italy.

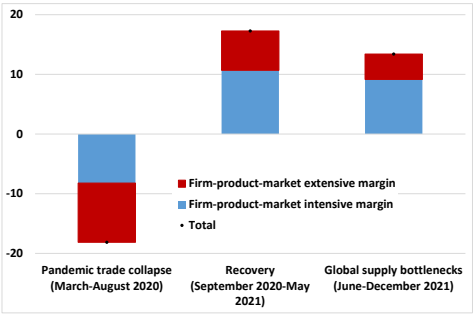
mattered most, followed by net negative product entry and finally by net negative firm entry (Fig. 3b).[19] Istat (2021) points to the destination extensive margin in particular being relatively more contained in France and Germany than in Italy.[20] Istat (2021) suggests that the relatively smaller export size of average Italian exporters vis-à-vis those in the other two economies, documented for example also in Giordano and Lopez-Garcia (2021), may have limited Italian firms' ability to adapt their sales to the unprecedented shock. We will come back to this point when investigating breakdowns by export size.

On aggregate, massive firm exit did not occur, a fact that may be explained by the large sunk costs of entering foreign markets, which create an option value of remaining an exporter during a downturn (Roberts and Tybout, 1997). Another explanation is that firm exit was in part avoided also thanks to public support to enterprises in the sectors hardest hit by the mandatory closures.[21]

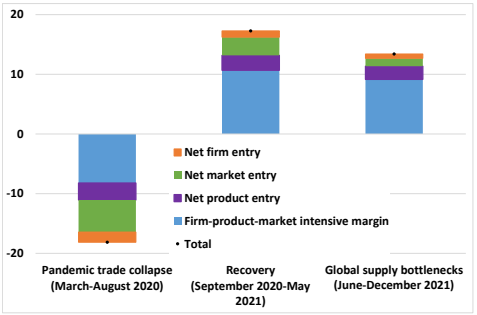
The immediate export rebound that started in September 2020 was largely driven by the intensive margin (62 per cent), and only to a much lesser extent by net positive entry of products, destinations and firms. Similarly, the subsequent slowdown was mostly explained by the reduction in incumbent export transactions, with the intensive margin accounting for nearly 70 per cent of aggregate export growth. By 2021 the number of firm-product-destinations with non-negative exports was higher than that in 2019, implying a full recovery of the overall extensive margin.[22]

Figure 3: **Contributions to growth in aggregate goods exports by trade margin**
(percentage points and changes; current prices)

(a) Intensive and extensive margins



(b) Intensive margin and a breakdown of the extensive margin



Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: The different margins are explained in the main text. The total refers to the monthly percentage change of total goods exports relative to the corresponding month of the previous year, averaged within each period.

[19]This evidence of prominent negative net destination entry is confirmed when the ordering of dimensions in the decomposition in equation 2 is switched to firms, destinations and products (results available upon request). Moreover, it is again consistent with the macro results in Istat (2021), although the latter cannot capture firm turnover, given the macro nature of the data employed.

[20]According to the firm-level analysis in Bricongne et al. (2022), net market entry was anyhow the main channel of extensive margin adjustment also for French firms in 2020.

[21]On this point, also see Istat (2023) for a quantification of the impact of these subsidies on Italian firms' financial soundness during the pandemic.

[22]The trade margin decomposition is very similar if we focus solely on manufacturing firms (Fig. B1 in Annex B). The contribution of net firm entry becomes even more negligible, and turns marginally negative when global supply disruptions kicked in in 2021. Sourcing difficulties indeed hampered the activity of manufacturing enterprises more than that of service firms, mainly involved in distribution and with notably higher inventory levels.

Digging deeper into different firms' reactions to the COVID-19 and the later global supply bottleneck shocks along the heterogeneity dimensions discussed in Section 4, we find that the trade margin decomposition results are polarized by export size, as seen for example in Bricongne et al. (2012) for French firms during the Great Trade Collapse. It is indeed the Happy Few that mostly drove aggregate export developments over the entire period under analysis (Table 5), reflecting the highly skewed distribution of exports reported in Figure 2a. Moreover, the Happy Few were the only firms that adjusted the volume of their exports to changing cyclical conditions more than operating at the extensive margin even during the exceptional pandemic trade collapse. In detail, during the first wave of the pandemic not surprisingly firms in all percentile bins recorded negative figures in both the intensive and extensive margins.[23] However, top exporters alone explained nearly 60 per cent of the aggregate contraction: 70 per cent of the intensive margin loss was absorbed by these firms, which instead accounted for only half of the extensive margin (largely by exiting destinations).[24] The aggregate extensive margin seen in Figure 3a is however large also because already firms in the 95–99 bins operated significantly along this margin, again mainly by exiting destination countries. A possible explanation of the relatively smaller extensive margin in France and Germany mentioned earlier is that in these two countries also the firms in the 95-99 export size bin – which plausibly are larger in export value terms than in Italy – adjusted mainly along the intensive margin, contributing, together with the Happy Few, to the aggregate outcome.[25] The contributions of the bottom 80 per cent of exporters, both on the intensive and extensive margins, were close to nil. Interestingly, the largest adjustment for these smallest exporters concerned net firm entry: some of the smallest firms simply ceased to export during the first pandemic wave.

Another way to see the dominant role of firm exit for the smallest exporters and the role of the intensive margin for the Happy Few is to get a sense of which firms halted their foreign sales at the peak of the trade collapse in April 2020, similarly to Bricongne et al. (2022). Figure 4a compares the distribution of export values (in logs) of firms that exported in April 2019, but interrupted their exporting activity exactly a year later ("April 2020 exiters"), against the distribution of all exports in April 2019. The distribution of exiters is clearly more skewed to the left relative to that of the full set of exporters, implying that the firms that ceased to export were smaller on average than continuing exporters. Figure 4b instead reports the evolution of the export size distribution of incumbent exporters between April 2019 and April 2020. The distribution during the pandemic is shifted to the left, implying that continuing exporters reduced their export values, graphically confirming the relevance of the intensive margin for these firms, including for the Happy Few.

During the recovery and the subsequent slowdown, the importance of the intensive margin relative to the extensive margin of the Happy Few increased (again see Table 5). A significant driver of the deceleration in the period of shortages of materials and equipment was the drop in the top exporters' intensive margin relative to the rebound months, in particular due to a lower positive intensive adjustment. Conversely, the other exporters' contributions via the intensive margin strengthened during the slowdown.

One possible explanation of the finding that the export expansion of the Happy Few was significantly hampered both during the pandemic and by the global supply bottlenecks that arose

[23] The only exception is the intensive margin of the smallest exporters, which was zero, since the positive and negative effects offset each other.

[24] Note how in general the gross contributions of each margin of trade is substantially larger than their net contributions, as documented for example in Buono et al. (2008), Bernard et al. (2009) and Amador and Opromolla (2017), due to significant churning amongst firms, products and destinations and to simultaneous creation and destruction of export relations.

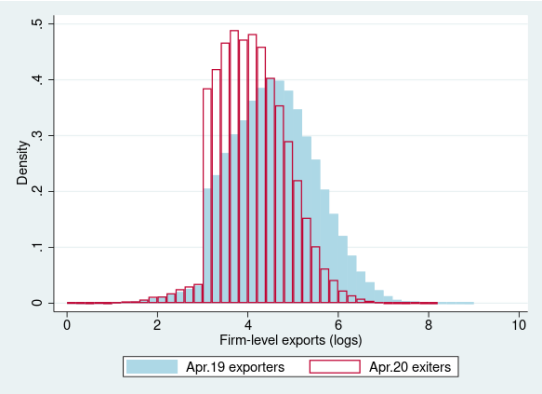
[25] Unfortunately, neither Bricongne et al. (2022) nor Brussevich et al. (2022) report trade margin decompositions by export size class for 2020, such that we cannot validate this hypothesis at least on French data.

Table 5: **Contributions to percentage variation in aggregate goods exports by trade margin and by exporter size percentiles**

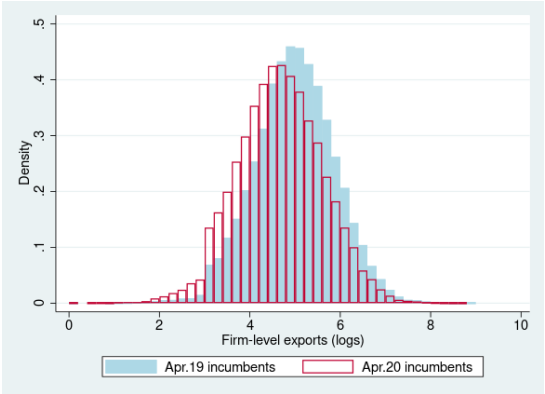
	Pandemic trade collapse (March-August 2020)					**Recovery (September 2020-May 2021)**					**Global supply bottlenecks (June-December 2021)**				
	0-80	*80-95*	*95-99*	*>99*	*Total*	*0-80*	*80-95*	*95-99*	*>99*	*Total*	*0-80*	*80-95*	*95-99*	*>99*	*Total*
Firm entry	1.2	0.6	0.4	0.9	3.0	2.0	1.1	0.5	1.1	4.6	1.7	0.7	0.4	1.1	3.9
Firm exit	-1.5	-1.3	-0.8	-1.2	-4.7	-1.1	-0.8	-0.5	-1.3	-3.6	-1.2	-0.8	-0.5	-0.7	-3.2
Net firm entry	**-0.3**	**-0.7**	**-0.4**	**-0.3**	**-1.7**	**0.9**	**0.3**	**0.0**	**-0.2**	**1.0**	**0.5**	**-0.1**	**0.0**	**0.4**	**0.7**
Product entry (within continuing firms)	1.0	1.9	1.5	1.8	6.2	1.4	2.8	2.5	3.7	10.4	1.5	2.5	2.1	4.0	10.1
Product exit (within continuing firms)	-1.0	-2.5	-2.3	-3.2	-9.0	-1.0	-2.1	-1.8	-2.9	-7.9	-1.2	-2.1	-1.8	-2.8	-7.9
Net product entry	**0.0**	**-0.7**	**-0.8**	**-1.5**	**-2.8**	**0.4**	**0.7**	**0.7**	**0.7**	**2.5**	**0.3**	**0.4**	**0.3**	**1.2**	**2.2**
Destination entry (within continuing products)	0.8	2.9	3.6	5.2	12.4	1.1	4.2	5.4	8.1	18.9	1.2	4.2	5.1	7.3	17.8
Destination exit (within continuing products)	-0.8	-3.7	-4.9	-8.3	-17.8	-0.9	-3.4	-4.4	-7.2	-15.8	-1.0	-3.6	-4.5	-7.4	-16.4
Net destination entry	**-0.1**	**-0.9**	**-1.3**	**-3.1**	**-5.4**	**0.2**	**0.8**	**1.0**	**0.9**	**3.0**	**0.2**	**0.6**	**0.6**	**-0.1**	**1.3**
Firm-product-destination extensive margin	**-0.3**	**-2.2**	**-2.5**	**-4.9**	**-9.9**	**1.6**	**1.8**	**1.7**	**1.5**	**6.6**	**1.1**	**0.9**	**0.8**	**1.5**	**4.3**
Intensive positive	0.6	2.7	4.3	9.9	17.6	1.0	4.3	7.5	18.2	31.0	1.1	4.4	7.4	16.4	29.4
Intensive negative	-0.6	-3.4	-6.2	-15.5	-25.8	-0.7	-3.1	-5.1	-11.4	-20.3	-0.8	-2.8	-4.8	-11.9	-20.3
Firm-product-destination intensive margin	**0.0**	**-0.7**	**-1.9**	**-5.6**	**-8.2**	**0.3**	**1.2**	**2.4**	**6.8**	**10.7**	**0.4**	**1.6**	**2.7**	**4.5**	**9.2**
Total	**-0.4**	**-2.9**	**-4.4**	**-10.5**	**-18.1**	**1.8**	**3.0**	**4.2**	**8.3**	**17.3**	**1.4**	**2.5**	**3.5**	**6.0**	**13.4**

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.

Figure 4: Export distribution of different exporters



(a) Export distribution of April 2020 exiters vs. all exporters in April 2019



(b) Export distribution of April 2019 continuing exporters vs. April 2020 continuing exporters

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.

in the second part of 2021 is their strong involvement in international production organizations. To test for this we hence also decompose aggregate export developments according to all exporters' GVC participation intensity in order to capture any heterogeneity in trade adjustments along this dimension. We then zoom into the subset of GVC integrated firms that also resorted to JIT models to assess any further relevant heterogeneous adjustments. During the 2020 trade downturn the (negative) intensive and extensive margins of GVC firms were broadly balanced, whereas enterprises that were not integrated in international production chains suffered more on the extensive margin (Tab 6).[26] This result is consistent with evidence in Section 4, according to which non-GVC participating firms are generally smaller exporters. Again, the rebound was driven by the intensive margin for GVC firms, but not for the non-GVC counterparts. Finally, it is noteworthy that in the second half of 2021 the export slowdown was largely due to the reduction in the contribution of GVC firms, which adjusted along both trade margins. The intensive margin of non-GVC participating firms instead increased in this period, suggesting a significantly milder exposure to global shortages than their GVC counterparts.

GVC firms could have however displayed a different export behaviour according to their type of business model. Indeed, during the pandemic moderate JIT and not JIT GVC firms contributed equally and by nearly half each to the trade downturn (Table 7). However the former mainly adjusted on the intensive margin, presumably by lowering their foreign sales to adjust to their lean inventories, whether the latter largely operated on the extensive margin, in particular by exiting destination countries. During the global supply bottleneck period instead the reduction in the positive contribution of (both moderate and intensive) JIT firms to aggregate GVC firms' export dynamics was sharp, and largely on the intensive margin, determining the bulk of the slowdown; by contrast, the stimulus stemming from enterprises that did not resort to JIT strategies increased. GVC-participating firms that in particular adopted a JIT model were hence notably more vulnerable to the supply shock in those months than their non-JIT counterparts.

To sum up, we find that the Happy Few were the main drivers of both of the pandemic trade collapse and of the export slowdown recorded in the second half of 2021, mainly operating at the intensive margin. Similarly, firms that participated in GVCs, which were strongly hit by

[26]The largest contributor to the extensive margin was the reduction in the range of destinations served.

the demand and supply shock of the pandemic and then by the later supply shock in the second part of 2021 were also protagonists. In this second period the negative backward linkages took their toll especially on GVC firms that adopted JIT models.

Table 6: **Contributions to percentage variation in aggregate goods exports by trade margin and by GVC integration**

	Pandemic trade collapse (March-August 2020)					**Recovery (September 2020-May 2021)**					**Global supply bottlenecks (June-December 2021)**				
	Intensive	*Moderate*	*Not*	*Unclassified*	*Total*	*Intensive*	*Moderate*	*Not*	*Unclassified*	*Total*	*Intensive*	*Moderate*	*Not*	*Unclassified*	*Total*
Firm entry	0.1	0.3	0.6	2.0	3.0	0.2	0.6	1.1	2.8	4.6	0.1	0.3	0.7	2.9	3.9
Firm exit	-0.3	-0.8	-1.3	-2.3	-4.7	-0.2	-0.5	-0.8	-2.1	-3.6	-0.1	-0.6	-0.8	-1.6	-3.2
Net firm entry	**-0.2**	**-0.5**	**-0.7**	**-0.3**	**-1.7**	**0.0**	**0.1**	**0.3**	**0.7**	**1.0**	**-0.1**	**-0.3**	**-0.2**	**1.3**	**0.7**
Product entry (within continuing firms)	0.6	2.6	1.8	1.1	6.2	1.0	4.8	2.9	1.7	10.4	1.0	4.4	2.5	2.2	10.1
Product exit (within continuing firms)	-1.2	-3.8	-2.3	-1.6	-9.0	-0.8	-3.4	-1.9	-1.7	-7.9	-0.7	-3.6	-2.0	-1.6	-7.9
Net product entry	**-0.6**	**-1.2**	**-0.6**	**-0.5**	**-2.8**	**0.1**	**1.4**	**1.0**	**0.0**	**2.5**	**0.3**	**0.8**	**0.5**	**0.6**	**2.2**
Destination entry (within continuing products)	2.0	6.2	2.7	1.5	12.4	3.2	9.7	4.0	2.0	18.9	2.8	8.9	3.8	2.3	17.8
Destination exit (within continuing products)	-3.4	-8.8	-3.5	-2.2	-17.8	-2.9	-7.3	-3.1	-2.5	-15.8	-2.7	-7.7	-3.2	-2.8	-16.4
Net destination entry	**-1.4**	**-2.6**	**-0.8**	**-0.6**	**-5.4**	**0.3**	**2.3**	**0.8**	**-0.4**	**3.0**	**0.1**	**1.2**	**0.5**	**-0.6**	**1.3**
Firm-product-destination extensive margin	**-2.2**	**-4.3**	**-2.0**	**-1.4**	**-9.9**	**0.5**	**3.8**	**2.1**	**0.2**	**6.6**	**0.3**	**1.7**	**0.9**	**1.4**	**4.3**
Intensive positive	3.7	7.8	2.8	3.2	17.6	6.9	14.6	4.7	4.8	31.0	6.4	13.9	4.9	4.3	29.4
Intensive negative	-5.8	-12.2	-3.9	-3.9	-25.8	-4.4	-9.2	-3.4	-3.3	-20.3	-4.4	-9.6	-3.1	-3.1	-20.3
Intensive margin	**-2.1**	**-4.4**	**-1.1**	**-0.7**	**-8.2**	**2.4**	**5.4**	**1.4**	**1.4**	**10.7**	**2.0**	**4.3**	**1.7**	**1.1**	**9.2**
Total	**-4.3**	**-8.7**	**-3.1**	**-2.1**	**-18.1**	**2.9**	**9.2**	**3.5**	**1.6**	**17.3**	**2.4**	**5.9**	**2.6**	**2.5**	**13.4**

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data and on Cerved data.

Table 7: **Contributions to percentage variation in GVC firms' goods exports by trade margin and by degree of adoption of JIT models**

	Pandemic trade collapse (March-August 2020)					**Recovery (September 2020-May 2021)**					**Global supply bottlenecks (June-December 2021)**				
	Intensive	*Moderate*	*Not*	*Unclassified*	*Total GVC*	*Intensive*	*Moderate*	*Not*	*Unclassified*	*Total GVC*	*Intensive*	*Moderate*	*Not*	*Unclassified*	*Total GVC*
Firm entry	0.0	0.1	0.2	0.2	0.4	0.1	0.2	0.1	0.3	0.7	0.0	0.1	0.1	0.2	0.3
Firm exit	-0.1	-0.4	-0.3	-0.3	-1.1	-0.1	-0.2	-0.2	-0.2	-0.6	-0.1	-0.2	-0.2	-0.2	-0.7
Net firm entry	**-0.1**	**-0.3**	**-0.1**	**-0.1**	**-0.7**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.4**
Product entry (within continuing firms)	0.3	1.1	1.2	0.6	3.2	0.4	2.5	2.0	0.9	5.8	0.3	2.5	1.8	0.8	5.4
Product exit (within continuing firms)	-0.4	-1.7	-2.2	-0.8	-5.0	-0.3	-1.7	-1.6	-0.7	-4.3	-0.4	-1.9	-1.4	-0.7	-4.3
Net product entry	**-0.2**	**-0.5**	**-1.0**	**-0.1**	**-1.8**	**0.1**	**0.8**	**0.4**	**0.2**	**1.5**	**0.0**	**0.5**	**0.4**	**0.1**	**1.1**
Destination entry (within continuing products)	0.5	3.1	3.7	0.8	8.2	0.9	5.0	5.6	1.4	12.9	0.8	4.3	5.4	1.3	11.7
Destination exit (within continuing products)	-0.7	-4.6	-5.6	-1.2	-12.1	-0.8	-3.5	-4.8	-1.1	-10.2	-0.7	-3.9	-4.5	-1.3	-10.4
Net destination entry	**-0.2**	**-1.5**	**-2.0**	**-0.3**	**-3.9**	**0.1**	**1.5**	**0.8**	**0.3**	**2.7**	**0.1**	**0.4**	**0.8**	**0.0**	**1.3**
Firm-product-destination extensive margin	**-0.5**	**-2.3**	**-3.1**	**-0.6**	**-6.5**	**0.2**	**2.3**	**1.1**	**0.6**	**4.3**	**0.0**	**0.8**	**1.2**	**0.1**	**2.0**
Intensive positive	1.1	5.3	3.8	1.3	11.6	2.0	10.3	7.0	2.2	21.5	1.6	9.2	7.6	1.9	20.3
Intensive negative	-1.6	-8.8	-6.3	-1.5	-18.1	-1.1	-6.2	-4.9	-1.4	-13.6	-1.3	-6.8	-4.1	-1.8	-14.0
Intensive margin	**-0.4**	**-3.5**	**-2.5**	**-0.1**	**-6.5**	**0.9**	**4.1**	**2.1**	**0.7**	**7.9**	**0.3**	**2.4**	**3.5**	**0.1**	**6.3**
Total	**-0.9**	**-5.8**	**-5.6**	**-0.7**	**-13.0**	**1.2**	**6.4**	**3.2**	**1.3**	**12.1**	**0.2**	**3.2**	**4.7**	**0.2**	**8.3**

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data and on Cerved data.

6 Disentangling the roles of product and geographical specialization and of firm heterogeneity

6.1 The econometric shift-share exercise

Thus far we have examined the algebraic contribution of exports of different firm groupings to aggregate export dynamics. In this section we instead systematically disentangle the contributions of products and destinations from that of firm types. Indeed it may be the case that certain categories of firms were harder hit by the 2020 trade collapse or by 2021 input shortages simply because they were more exposed to products and/or countries that were hardest hit, and not because of their export size or involvement in GVCs or degree of recourse to a JIT model. It is in fact plausible that larger exporters have different export portfolios than smaller ones.

To this end we conduct an econometric shift-share decomposition, following Cheptea et al. (2005), Bricongne et al. (2012) Cheptea et al. (2014), in order to factor in the role of geographical and product composition. Instead of decomposing export growth by algebraic methods, such as by applying the Constant Market Share (CMS) method (see for example Bugamelli et al., 2018 and Istat, 2021 applied to Italy) whose results strongly depend on the ordering of the geographical and sectoral effects, we employ a weighted variance analysis (ANOVA) that allows performing fixed-effects econometric estimations at the most granular level of the data. This method furthermore allows evaluating the confidence intervals for each product, destination and exporter effect. Intuitively, this approach measures the export growth of each firm category as if all exporters had the same geographical and product specialization, hence teasing out the role of firm heterogeneity.

As is standard in the international trade literature (e.g. Buono et al., 2008; Bernard et al., 2009), we first compute mid-point growth rates on elementary firm-product-destination-month export flows. The advantage of computing mid-point, relative to traditional, growth rates is that the former are well defined in cases of newly created or destroyed flows, a common feature of our high-frequency data as documented in Section 5, thus accounting for the extensive margin as well as the intensive margin. Furthermore, in the case of small changes, the midpoint growth rate is a very good approximation of the y-o-y percentage changes employed thus far. Finally, this measure aggregates up exactly, such that the overall growth rate can be expressed as a weighted average of elementary flow growth rates, with no need for approximation.

In formal terms, for a firm f exporting value x of product k to destination country j in month t, the mid-point growth rate is computed as:

$$g_{fkjt} = \frac{x_{fkjt} - x_{fkjt-12}}{\frac{1}{2}(x_{fkjt} + x_{fkjt-12})} \tag{3}$$

This measure is bounded by -2 and +2: all flows corresponding to an entry (exit) display a value of +2 (-2). Changes in the size of existing flows show a value between -2 and 0 if flows have decreased over time and between 0 and +2 if flows have increased over time. The weight attached to each elementary growth rate g_{fkjt} is given by the relative share of the flow in total goods exports:

$$w_{fkjt} = \frac{x_{fkjt} + x_{fkjt-12}}{\Sigma_f \Sigma_k \Sigma_j x_{fkjt} + \Sigma_f \Sigma_k \Sigma_j x_{fkjt-12}} \tag{4}$$

The y-o-y change in the total value of exports can be obtained by summing each individual flow g_{fkjt} weighted by w_{fkjt}:

$$G_t = \Sigma_f \Sigma_k \Sigma_j g_{fkjt} w_{fkjt} \tag{5}$$

In order to conduct the econometric shift-share analysis, mid-point growth rates are regressed at each month t on a set of three dummy variables: countries, HS2 products and a dimension of firm heterogeneity (export size or GVC engagement or JIT intensity, as previously defined).[27] In formal terms:

$$g_{fkjt} = \alpha_f + \beta_k + \gamma_j + \epsilon_{fkjt} \tag{6}$$

where the first term is the firm category dummy under study, the second is the HS2 product fixed effect, the third is the destination fixed effect and ϵ_{fkjt} is the error term.

Weighted OLS estimation is employed, where the weights are given by the relative share of an elementary export flow defined in equation 4. The estimated coefficients are then normalized so as to express them as deviations from the average export growth rate of the whole sample in each month. This normalization of coefficients allows deriving the export changes that the different firm categories would have recorded if their product and geographical mixes had been equal to the average of the full sample in a given point of time. Marginal averages (i.e. the marginal impact in aggregate exports of a given product or destination or firm type) are computed from the estimated fixed effects and compared to the unconditional averages. For presentation purposes we average results within each sub-period.

6.2 Results

We start by commenting on the estimations when the dimension of firm heterogeneity included in equation 6 is export size. Similarly to what was found by Bricongne et al. (2012) for the 2008 Great Trade Collapse in France, product effects are found to explain the lion's share of the variance of total exports (namely 65 per cent on average over 2020–21), followed by destination effects, which contributed by about one third. There are no significant differences in these contributions across the three sub-periods under study, yet for example substantial product heterogeneity stands out when comparing the pandemic trade collapse and the 2021 global input shortage period. Indeed, during the first episode the products that recorded the largest drops in exports were mostly clothing and textile articles, as well as luxury goods (Table B4 in Annex B). The demand for these products notably collapsed due to the social distancing measures implemented world-wide, as did their supply owing to their non-essential nature which led to factory closures in Italy. Exports in fuels and oils also declined due to the downturn in the world economy. By contrast, exports of food products and of chemical products thrived. In the slowdown of the second half of 2021 zinc articles and transport equipment, both affected by input shortages, were amongst the most adversely affected goods (Table B5). Pharmaceutical products also did not fare well, in that after a strong export performance over the decade 2010-20 foreign sales temporarily declined in 2021, especially in non-European markets such as the United States (Farmindustria, 2022). By contrast, the least hurt products in the second half of 2021 included some that had performed extremely badly during the pandemic and which were rapidly recovering in line with increasing demand, in particular oils and fuels, whose exports in value terms also benefited from rising energy prices.

The geography of exports played a lesser role during the pandemic, given the broad synchronicity of the recession at the global level (Table B6). One exception is China, which passed from being amongst the least harmed destination during the pandemic trade collapse (on this, see also OECD, 2021) to being one of the most seriously affected in the second semester of 2021 (Table B7). This was due to the different timing of the first COVID-19 outbreaks between China and Italy. A sharp drop in Italy's foreign sales to China was recorded in the initial months

[27] We aggregate products up to the HS2 level both for computational feasibility and for ease of presentation of the results.

of 2020, when the latter economy was already in lockdown. This decline eased in the second quarter of 2020 and by the third quarter exports to this economy were already rebounding. By contrast, in the second half of 2021 the Chinese economy was again shut down, constraining its demand. Another noteworthy finding is that the UK was the only European market which fared very poorly during the global supply bottlenecks period – whereas several other European economies simultaneously featured amongst the best performers –, suggesting a negative drag for the former country stemming also from Brexit.

When controlling for the geographical and product orientation of exports, the Happy Few are found to have recorded the largest export collapse during the COVID-19 shock, as well as to have posted the most sluggish growth rates during the global supply bottleneck slowdown (Fig. 5). In general, the larger the export size of firms, the weaker their export performance throughout 2020-21.[28] Moreover, the top and bottom exporters were not evenly impacted by the two shocks. The Happy Few's exports were in fact concentrated in destinations or products that were slightly less affected by the trade collapse, which partly cushioned their losses, whereas the smallest exporters were disproportionately represented in adversely affected products and destinations. Indeed, the average monthly y-o-y export drop recorded for the Happy Few during the pandemic downturn would have been equal to –23.0 per cent, had their export structure been similar to the cross-destination and cross-product average Italian exporter in that period (against the actual -22.7 per cent). By contrast, the export contraction of the smallest firms would have amounted to -9.0 per cent, against the actual -10.1 per cent. Similarly polarized results are found when global supply bottlenecks kicked in in 2021: the conditional export growth differential between the firms at the two extremes of the export distribution is equal to 14.4 percentage points, with the top exporters increasing their foreign sales at a rate of 8.4 per cent and the bottom exporters by 22.8 per cent, against an actual growth differential of 12.2 points.

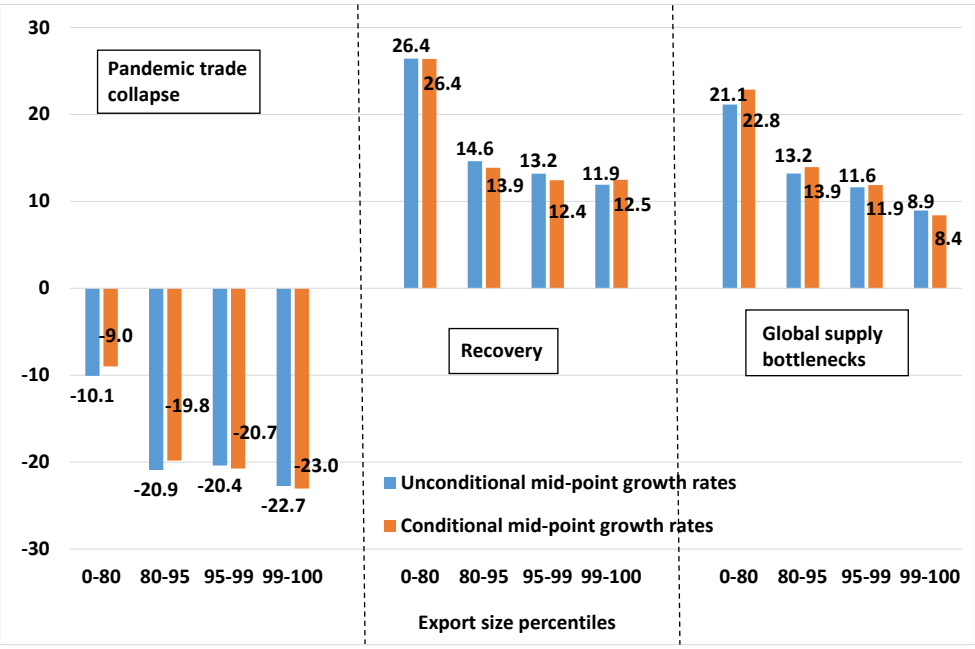
Following Bricongne et al. (2022), in Figure B2 we zoom into the three months at the peak of the first pandemic wave and the three months in which global supply bottlenecks were at their highest in 2021, according to the Global Supply Chain Pressure Index, and compare them to similar periods in 2019, again abstracting from product and geographical effects. We confirm that the Happy Few performed significantly worse relative to smaller exporters, whereas in the pre-pandemic year their export growth was substantially higher.

If it is not product nor geographical composition that explains the Happy Few's relatively poor performance, the larger GVC exposure of top exporters relative to the other firms could plausibly explain their stronger reaction to the shocks. To verify whether indeed GVC involvement dampened export performance, we estimate equation 6 on product, destination and GVC intensity bin fixed effects on the full sample of exporters.[29] Intensive GVC firms are indeed found to be more affected by the pandemic trade collapse and their immediate rebound was significantly weaker than moderate GVC and non-GVC participating firms, whose export declines and subsequent recoveries were not statistically significantly different (Fig. 6). This lack of distinction between non-GVC and moderate GVC firms is presumably due to the nature of the pandemic shock, which acted both on the supply and on the demand side, hence impacting all exporters. Indeed, for French firms Bricongne et al. (2022) do not find evidence that the large reactions of top exporters were due to their engagement in GVCs specifically for 2020. By contrast, in the second half of 2021 when the shock was solely on the supply side due to bottlenecks, the result for Italian firms is starker and becomes monotonic, as well as again being

[28]The differences between the (conditional) growth rates across export size percentiles are statistically significant according to the estimated confidence intervals, available upon request.

[29]Restricting these regressions to the subset of 1,242 Happy Few leads to less robust results, such that we prefer to report estimates on the full set of exporters as baseline results.

Figure 5: **Mid-point growth rates of goods exports by export size**
(percentage changes; current prices)

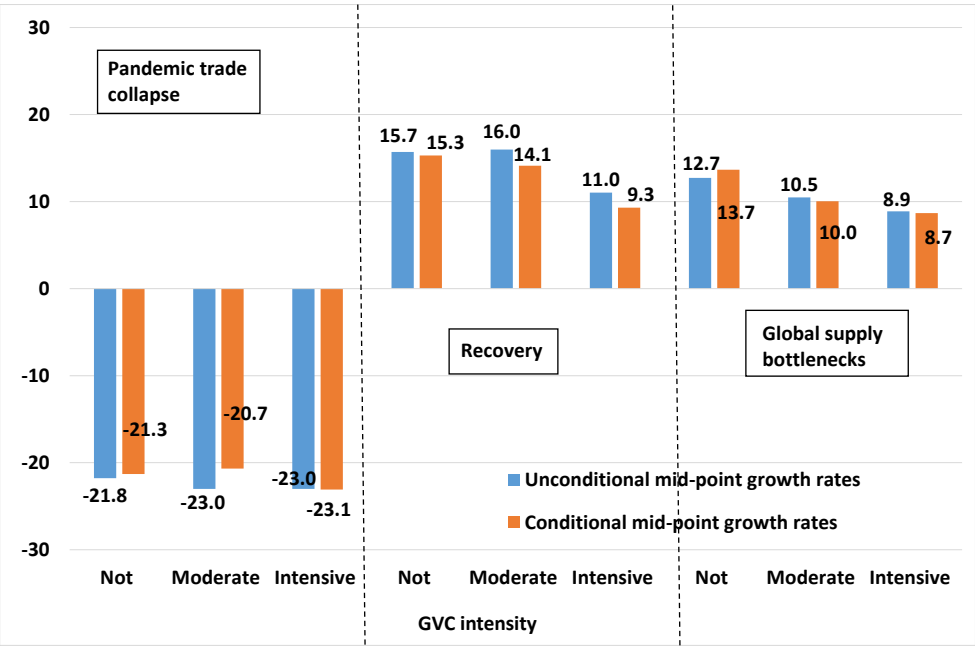


Source: Authors' estimates on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: Unconditional growth rates are actual average monthly mid-point growth rates relative to the corresponding month of the previous year in total goods exports over each period; conditional rates control for product and geographic specialization and are estimated as discussed in the main text.

statistically robust: the higher the intensity of GVC engagement, the significantly slower was export growth. This outcome is similar to that found by Lebastard et al. (2023), which extends the analysis of French firms' adjustments to 2021. Furthermore, amongst GVC firms the higher the recourse to JIT production strategies, the significantly more sluggish were export dynamics in this sub-period (Fig. 7).[30] This evidence suggests that high levels of inventories in part shielded firms from input shortages, as found for example for French firms in Brussevich et al. (2022) and in Lafrogne-Joussier et al. (2023).

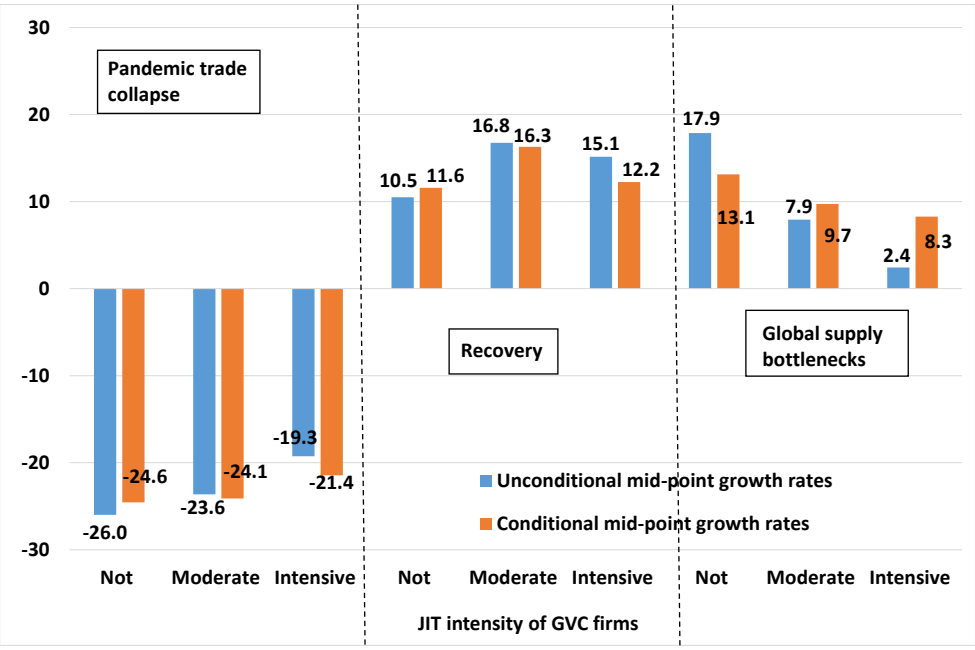
[30]The negative growth differential of JIT firms vs not JIT firms in the second half of 2021 is even more pronounced when focusing solely on the subset of the Happy Few, which for the sake of completeness we report in Figure B3 in Annex B, despite the number of observations being significantly smaller than our baseline results.

Figure 6: **Mid-point growth rates of goods exports by GVC participation**
(percentage changes; current prices)



Source: Authors' estimates on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: Unconditional growth rates are actual average monthly mid-point growth rates relative to the corresponding month of the previous year in total goods exports over each period; conditional rates control for product and geographic specialization and are estimated as discussed in the main text. The unclassified category has been omitted in this chart to enhance readability.

Figure 7: **Mid-point growth rates of GVC firms' goods exports by JIT intensity**
(percentage changes; current prices)



Source: Authors' estimates on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: Unconditional growth rates are actual average monthly mid-point growth rates relative to the corresponding month of the previous year in total goods exports over each period; conditional rates control for product and geographic specialization and are estimated as discussed in the main text. The unclassified category has been omitted in this chart to enhance readability.

7 Conclusions

This paper studies the developments of Italy's aggregate goods exports in 2020-21 through the lens of highly fine grained data for the near-universe of exporters. We document how the top exporters, amongst which a large share of Italy's exports are concentrated, defined the country's foreign sales even during the two unprecedented shocks of the pandemic trade collapse and of global supply bottlenecks in the second half of 2021. In particular, although all exporters were hurt by the pandemic, the Happy Few absorbed the largest part of the 2020 trade collapse, mainly at the intensive margin and, only to a lesser extent, by reducing their destination portfolios. On the other hand, some of the smallest players were forced to exit because they were unable to adjust. The Happy Few were also the main drivers of the export slowdown in second semester of 2021, again operating largely on the intensive margin.

Via an econometric shift-share exercise, which is methodologically sounder than a mere Constant Market Share algebraic analysis, we confirm the weaker export performance of the Happy Few relative to smaller firms in both episodes and we exclude that this result is driven by their geographical or product specialization. Indeed, to the contrary it was the smallest exporters that were concentrated in the hardest hit destinations and products during both shocks, yet on average performed better. One possible explanation of the larger responsiveness of the Happy Few to the two shocks that is documented in this paper is that integration in GVCs, a common trait amongst the top exporters, hurt these firms, especially when global input shortages and perturbations in the international transport system became widespread in the second half of 2021. Reliance on JIT models amongst GVC firms further significantly exacerbated the exposure to the negative supply chain shock in this period, whereas exports of more inventory-intensive firms were more insulated from the supply shock.

This evidence points, on the one hand, to a two-year interruption of the favourable streak observed in the previous decade for top exporters (Istat-Ice, 2023). On the other hand, Italy's smaller exporters, which were generally harder hit by previous trade shocks (e.g. Bugamelli et al., 2018), displayed a notable tenacity in bouncing back after the first pandemic wave, as the full recovery by 2021 of the aggregate extensive margin suggests.

At the time of writing of the paper, customs data were available only until December 2021, hence missing out on 2022, a year which recorded in its first half a further dramatic rise in supply disruptions linked to the Russian invasion of Ukraine and the subsequent sanctions imposed by the international community, and then an easing of these pressures in its second half. It is hence not yet possible to shed light on whether the Happy Few have or not "regained their happiness" in the most recent period.[31] However, the fact that the top exporters operated largely at the intensive margin in 2020-21 points to their resilience in foreign markets and bodes well for a swift recovery as cyclical macroeconomic conditions improved. In 2022 Italy's aggregate goods exports marked strong growth, even relative to its main euro-area peers (Giglioli and Giordano, 2023), and it would be surprising if the Happy Few did not play a role.

Moreover, the findings documented in this paper confirm how both implementing diversification strategies for the sourcing of key inputs, both domestically and abroad, and inventory practices that allow for some degree of stockpiling of these same inputs could increase Italian firms' resilience to supply chain shocks. Very recent survey evidence has pointed to Italian enterprises indeed re-optimizing their sourcing, inventory and production strategies in 2022-23, in particular by diversifying suppliers and reducing reliance on critical inputs from countries, such as Russia or China, with which geopolitical relations have become strained. One hypothesis to

[31] To our knowledge, at the time of writing only Monducci (2023) provides a firm-level analysis for Italy covering the 2019-22 period, but it is based on a subset of exporting firms, namely the 46,272 continuing exporting firms in 2019, 2021 and 2022, sourced from ICE-Istat TEC-Frame SBS data.

be explored in future research is that the top exporters have been more active in this sense, also in light of their relatively more adverse 2020-21 export performance. For example, Hassan (2023) finds strong evidence of Italian firms affected by supply bottlenecks aiming to increase both the diversification of suppliers and the level of inventories of intermediates and materials. Bottone et al. (2023) document that firms sourcing from China are more actively reorganizing their supply chains through diversification and, to a lesser extent, reshoring of suppliers; preliminary evidence shows that these de-risking strategies are more common amongst the largest (in terms of number of employees) firms.

Annex A. Further details on the customs data

We rely on individual firm exports and imports recorded monthly by the Italian customs (*Agenzia delle Dogane e dei Monopoli*) at the NC8 product code and counterpart country level.[32] The period covered is January 2019 to December 2021. Our firm identifier is the VAT registration number, which accounts for a larger number of units than those identified by the fiscal identifier, since it also includes entities that are not formally organised as firms. In official Istat statistics, these units were 137,000 in 2019 (vis-à-vis 123,000 firms; Istat-Ice, 2023). In the customs dataset the number of units is higher (about 160,000), because Istat excludes units that are active for less then six months and because it resorts to data profiling in elaborating official statistics. We loosely call all units "firms".

Reporting obligations apply only if a firm exports above a legal threshold. More specifically, for exports to non-EU countries, it is mandatory for firms to declare their exports if the yearly value of their exports is EUR 1.000. For intra-EU trade, firms are required to compile a quarterly (as opposed to monthly) Intrastat module if the quarterly amount is below EUR 100.000 for at least one of the quarters in a given year. Moreover, they are only required to file their total exports, not necessarily detailed by product and destination. We hence disregard these (likely small and possibly intermittent) exporters since our analysis is monthly and because the product–destination information is crucial to our analysis.[33] One must be aware however that the switch of a firm below or above a reporting threshold is captured as exit from or entry into exporting in this study. Furthermore, the size threshold may bias the extensive margin computed herein, since tiny firms are more subject to extensive margin adjustments. Similar studies employing firm-level data anyhow suffer from these same limitations.

We exclude from our dataset the items belonging to HS2 Chapter 97 ('Works of art, collectors' pieces and antiques'), as well as monetary gold and military equipment and works of art; we also drop natural gas and electricity for which Istat uses alternative sources to track trade flows (SNAM and Terna, respectively). Furthermore, we discard exports to entities that are not referred to a specific jurisdiction (namely, stores and provisions, flows to countries and territories not specified in general and for commercial or military reasons and exports to maritime domains outside of territorial waters) and the so-called *voci della nomenclatura combinata (CN8) soggette a vincolo di riservatezza*, i.e. those products which for confidentiality reasons in some years are not reported at the 8-digit product level by Istat.

These exclusions have a negligible impact on total export values. To cite a few numbers, in 2019 the exports of firms with quarterly reporting obligations amounted to EUR 2.3 bln (for which EUR 2.0 bln are not matched with a product code); this figure accounts for about 0.5 per cent of total goods exports that year. Non-euro area transactions linked to stores and provisions account for only 0.3 per cent of official IMTS exports.

As seen in Table A1, the coverage of IMTS goods exports is extremely satisfactory, since nearly 99 per cent of these official flows are covered by our customs data. Coverage is especially high for exports to the EU but it is still nearly 98 per cent on average for non-EU flows.

Finally, for the purpose of the analysis in the main text and in order to deal with any remaining significant outliers and measurement errors, we winsorized y-o-y percentage changes of exports at the firm-product-destination level at the 5th and the 95th percentiles of the export distribution. Furthermore, we only retained firms that exported more than EUR 10.000 in at

[32] Whereas export flows are classified by destination country, import flows are classified by country of origin, i.e. the country from which the product is originally shipped, and by the country through which the good reaches Italy. Since this paper only uses aggregate import flows by firm, this distinction is not relevant for us.

[33] The reporting threshold did not change over the 2019–21 period analysed in this paper, so we did not have to tackle changing reporting requirements over time.

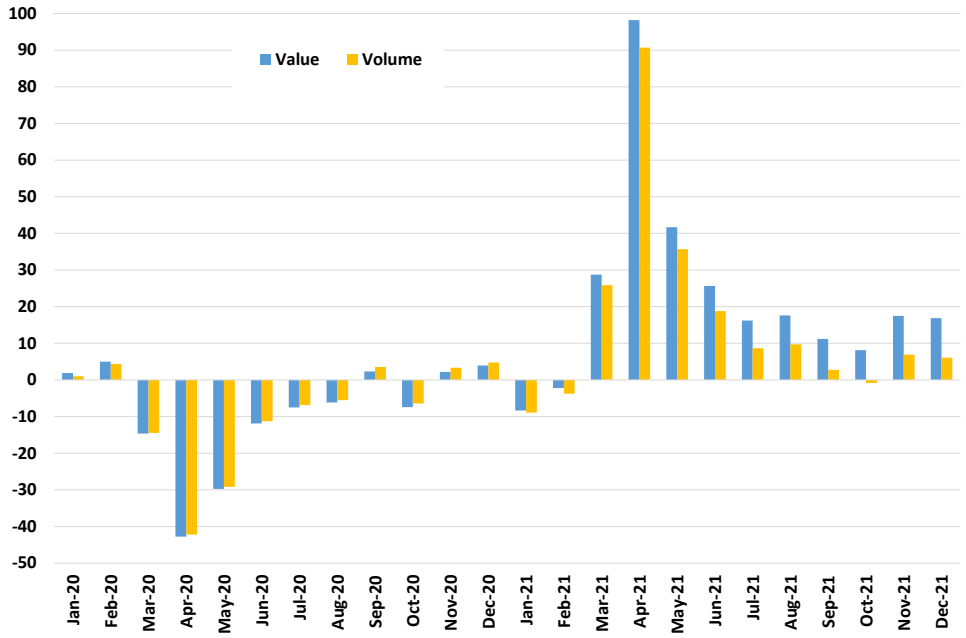
Table A1: **Export values according to customs data and coverage of official IMTS**

	Total			EU			Non-EU		
year	IMTS (EUR bln.)	Customs (EUR bln.)	**Customs/IMTS (%)**	IMTS (EUR bln.)	Customs (EUR bln.)	**Customs/IMTS (%)**	IMTS (EUR bln.)	Customs (EUR bln.)	**Customs/IMTS (%)**
2019	465.6	458.9	**98.5**	240.7	239.4	**99.5**	224.9	219.5	**97.6**
2020	424.3	420.4	**99.1**	221.4	220.4	**99.5**	202.9	200.0	**98.6**
2021	503.5	492.0	**97.7**	270.4	265.9	**98.3**	233.1	226.1	**97.0**

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data and Istat IMTS. Notes: The UK is included in the European Union throughout the period.

least one of the years in which they were active.[34] In this way we presumably exclude occasional exporting firms, which are not of material significance for our analysis.

Figure A1: **Goods export dynamics in value and volume terms**
(y-o-y changes)



Source: Authors' calculations on Istat IMTS and producer price indices.

Table A2: **The number of exporters and total export values by year in the merged customs-Cerved dataset**
(percentage shares)

Year	No. of manufacturing exporting firms	Total manufacturing export value (EUR bln)	No. of exporting firms	Total export value (EUR bln)
2019	48,264	337	96,327	394
2020	46,427	302	79,234	318
2021	46,066	357	82,004	403

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs and Cerved data.
Notes: Firms in the manufacturing sector are singled out only in the Cerved dataset, which includes information on the sector of economic activity.

[34]The threshold coincides with the 30th percentile of the distribution in 2019.

Annex B. Additional information and robustness checks

Table B1: **The number of exporters and average export values by firm type**
(units and EUR)

	N. exporting firms	**Average exports**
Export size:		
0-80	99,348	22,921
80-95	18,627	116,036
95-99	4,967	422,538
99-100	1,242	2,229,559
GVC participation:		
Not a GVC firm	32,520	138,088
Moderate GVC firm	20,711	292,593
Intensive GVC firm	3,354	616,544
Unclassified	67,599	134,061
JIT intensity of GVC firms:		
Not a JIT firm	7,615	404,811
Moderate JIT firm	7,000	474,016
Intensive JIT firm	2,070	389,784
Unclassified	7,380	124,530

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs and Cerved data.
Notes: Firm types are described in the main text. The reference year is 2019.

Table B2: **The share of exports of the Happy Few by destination**
(percentage shares)

Destination country	**Export share**
Germany	12.24
United States	10.87
France	10.39
United Kingdom	6.24
Switzerland	5.97
Spain	5.41
Belgium	3.84
China	2.85
Poland	2.74
Netherlands	2.32

Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs and Cerved data.
Notes: The top 10 destination countries by export value in 2019 are reported. The Happy Few are the firms in the top 1 per cent percentile of the export distribution (99-100 class in Table B1.

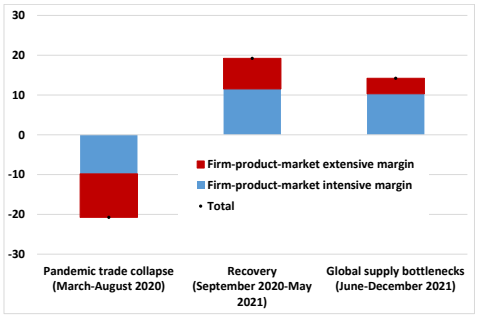
Table B3: **The share of exports of the Happy Few by HS2 product**
(percentage shares)

HS2 product	**Export share**
Nuclear Reactors, Boilers, Machinery And Mechanical Appliances	16.3
Vehicles Other Than Railway Or Tramway	11.3
Pharmaceutical Products	10.9
Electrical Machinery And Equipment	6.3
Mineral Fuels, Mineral Oils And Products	5.0
Precious Stones and Metals	3.7
Iron And Steel	3.5
Articles Of Apparel, Not Knitted Or Crocheted	3.0
Plastics And Articles Thereof	2.8
Articles Of Iron Or Steel	2.8

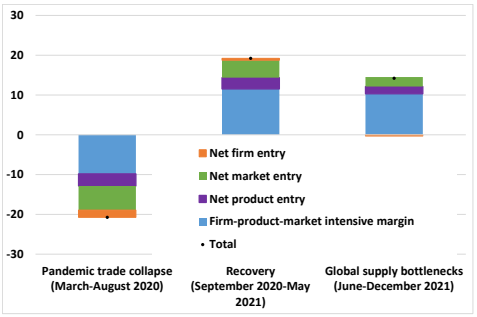
Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs and Cerved data.
Notes: The top 10 HS2 products by export values in 2019 are reported. The Happy Few are the firms in the top 1 per cent percentile of the export distribution (99-100 class in Table B1.

Figure B1: **Contributions to growth in manufacturing goods exports by trade margin**
(percentage points and changes; current prices)

(a) Intensive and extensive margins



(b) A breakdown of the extensive margin



Source: Authors' calculations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: The different margins are explained in the main text. The total refers to the monthly percentage change of total goods exports of manufacturing firms relative to the corresponding month of the previous year, averaged within each period.

Table B4: **Most and least harmed products during the pandemic trade collapse**

Ranking	**HS2 code**	**Product**	**Fixed effects**
		Most harmed products	
1	43	Furskins and artificial fur	-0.59
2	91	Clocks and watches	-0.44
3	27	Mineral fuels and oils	-0.39
4	57	Carpets	-0.36
5	50	Silk	-0.33
6	36	Explosives and pyrotechnic products	-0.33
7	51	Wool	-0.28
8	41	Leather	-0.28
9	62	Apparel and clothing articles	-0.28
10	78	Lead and lead articles	-0.26
		Least harmed products	
1	16	Preparations of meat and fish	0.26
2	8	Fruit and nuts	0.26
3	15	Edible fats and oils	0.28
4	23	Waste from food industries	0.28
5	12	Oil seeds and fruits	0.28
6	19	Preparations of cereals, flour and milk	0.29
7	38	Miscellaneous chemical products	0.33
8	10	Cereals	0.33
9	13	Gums and resins	0.34
10	14	Other vegetable products	0.34

Source: Authors' estimations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: The fixed effects are normalized fixed effects, whose weighted average equals 0.

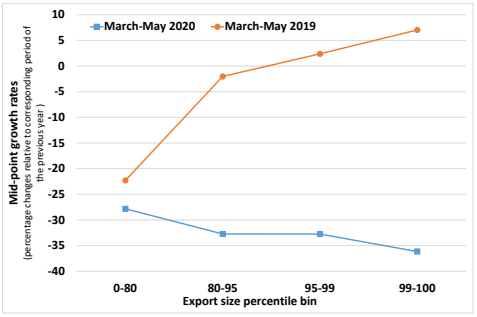
Table B5: **Most and least harmed products during the global supply bottlenecks period**

Ranking	HS2 code	Product	Fixed effects
		Most harmed products	
1	79	Zinc and zinc articles	-0.24
2	30	Pharmaceutical products	-0.23
3	92	Musical instruments	-0.19
4	96	Miscellaneous manufactured articles	-0.18
5	89	Ships and boats	-0.17
6	86	Railway locomotives and tracks	-0.17
7	14	Other vegetable products	-0.16
8	87	Vehicles other than railway vehicles	-0.16
9	12	Oil seeds and fruits	-0.14
10	67	Artifical flowers	-0.14
		Least harmed products	
1	46	Straw manufactures	0.18
2	74	Copper and copper articles	0.18
3	47	Pulp of wood and scrap paper	0.21
4	26	Ores and ash	0.25
5	31	Fertilisers	0.26
6	43	Furskins and artificial fur	0.30
7	13	Gums and resins	0.31
8	36	Explosives and pyrotechnic products	0.31
9	72	Iron and steel	0.33
10	27	Mineral fuels and oils	0.44

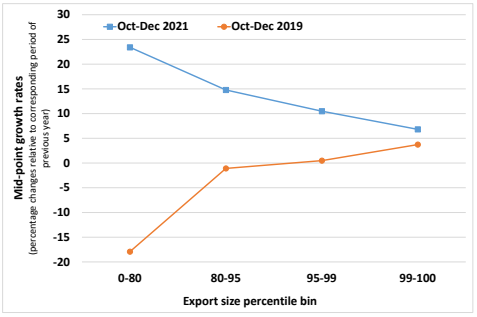
Source: Authors' estimations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: The fixed effects are normalized fixed effects, whose weighted average equals 0.

Figure B2: **Midpoint growth rates by export size bin**
(percentage changes; current prices)

(a) March-May 2020 vs. March-May 2019



(b) Oct-Dec 2021 vs Oct-Dec 2019



Source: Authors' estimates on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: HS2 product and destination fixed effects are controlled for.

Table B6: **Most and least harmed destinations during the pandemic trade collapse**

Ranking	Country code	Country	Fixed effects
	Most harmed destinations		
1	IN	India	-0.32
2	DZ	Algeria	-0.23
3	MT	Malta	-0.22
4	ZA	South Africa	-0.19
5	BR	Brazil	-0.18
6	MX	Mexico	-0.15
7	TN	Tunisia	-0.15
8	SI	Slovenia	-0.14
9	XS	Serbia	-0.09
10	ES	Spain	-0.08
	Least harmed destinations		
1	NL	Netherlands	0.07
2	KR	Korea	0.08
3	FI	Finland	0.10
4	CN	China	0.11
5	SA	Saudi Arabia	0.11
6	BE	Belgium	0.12
7	DK	Denmark	0.13
8	EG	Egypt	0.14
9	TW	Taiwan	0.14
10	CH	Switzerland	0.15

Source: Authors' estimations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: We only consider the largest 50 destinations of Italian exports in this table. The fixed effects are normalized fixed effects, whose weighted average equals 0.

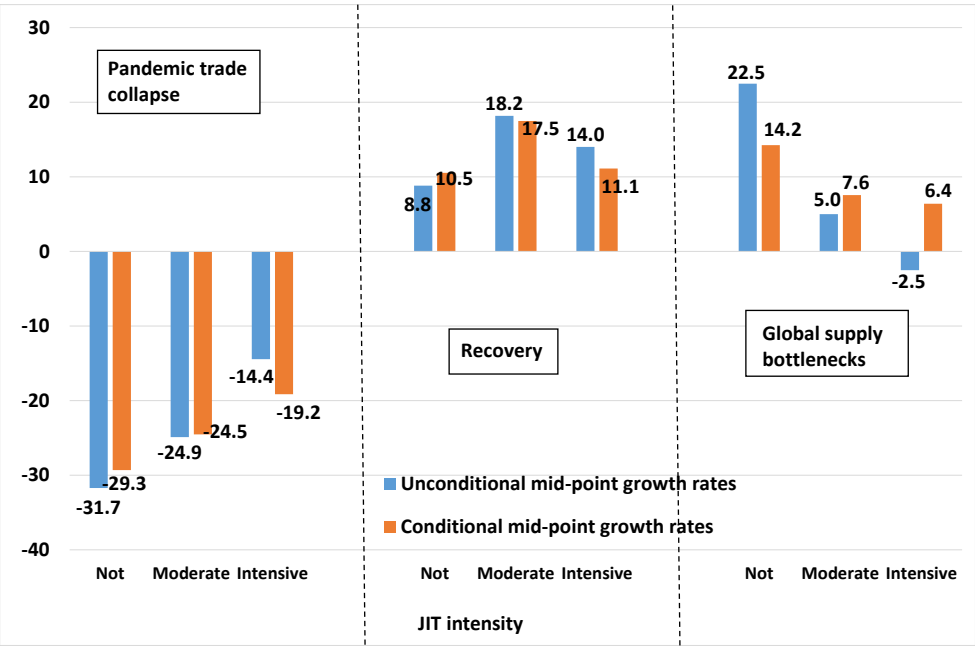
Table B7: **Most and least harmed destinations during the global supply bottlenecks period**

Ranking	Country code	Country	Fixed effects
	Most harmed destinations		
1	DZ	Algeria	-0.25
2	GB	United Kingdom	-0.16
3	SG	Singapore	-0.15
4	EG	Egypt	-0.13
5	CH	Switzerland	-0.13
6	MA	Morocco	-0.13
7	KR	Korea	-0.12
8	AU	Australia	-0.11
9	HK	Hong Kong	-0.08
10	CN	China	-0.08
	Least harmed destinations		
1	US	United States	0.06
2	IL	Israel	0.07
3	MX	Mexico	0.09
4	HR	Croatia	0.09
5	IN	India	0.10
6	GR	Greece	0.12
7	BE	Belgium	0.13
8	NL	Netherlands	0.16
9	ZA	South Africa	0.20
10	IE	Ireland	0.22

Source: Authors' estimations on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: We only consider the largest 50 destinations of Italian exports in this table. The fixed effects are normalized fixed effects, whose weighted average equals 0.

Figure B3: **Mid-point growth rates of goods exports of the Happy Few involved in GVCs by JIT intensity**

(percentage changes; current prices)



Source: Authors' estimates on *Agenzia delle Dogane e dei Monopoli* customs data.
Notes: Unconditional growth rates are actual average monthly mid-point growth rates relative to the corresponding month of the previous year in total goods exports over each period; conditional rates control for product and geographic specialization and are estimated as discussed in the main text. The unclassified category has been omitted in this chart to enhance readability.

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